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OLD AGE

ITS CARE AND TREATMENT IN HEALTH AND DISEASE

BY

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PREFACE

"Why shouldest thou die before thy time?"

Eccles. vii. 17

THIS question is quite proper to be asked as it implies no undue clinging to life or fear of death; rather is it a natural and sane desire to wish to live so long as the body can duly perform its functions, and it is a sound belief that this period may be prolonged by proper knowledge of the principles of health, and by due attention to them. These principles are discussed in the following pages, the first object of which is to teach how healthy old age may be attained. But in the second place, as old age is not immune from diseases, and as from disregard or ignorance of the principles of health, these are by no means few or unimportant, this book describes the diseases to which the aged are especially liable, points out how they are caused, by what means they may be avoided, and how they may be appropriately treated.

As no English writer has recently dealt with this subject it is hoped that there is room for a book which should bring together the various contributions made to it in modern times, including the

results of the writer's forty years of medical practice. He gladly acknowledges his indebtedness to those writers who have preceded him, whose names will be found quoted in the text, and whose works are set out in the bibliography. His especial thanks are due to his friend Mrs. Mary Coghill-Hawkes, M.D., for her kindness in contributing the section on "Exercises for Elderly Persons" (see Appendix VI.), which she has arranged expressly for this book.

R. S.

BIRMINGHAM
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OLD AGE

CHAPTER I

The Duration of Life

"Our life shall pass away as the traces of a cloud."—The Wisdom of Solomon.

"So Job died, being old and full of days."—Job xlii. 17.

We have been recently reminded by Professor Schaefer of the universal law that "all that lives must die, passing through Nature to Eternity"; that death is the last manifestation of life as natural as the oncoming of sleep; yet men have always been unwilling to face this truth, living as if they were destined to be immortal, and by a curious paradox it is the young who undervalue life and are often ready to throw it away for very inadequate reasons. Youth is easily depressed and from lack of experience dreads the dark future, and does not know how soon the gloomiest prospect may be succeeded by sunshine and happiness. Goethe was right in comparing the years of our life to the Sybilline Books, which became more valuable the fewer of them were left. As Hermann Weber has said, the dread of the future often poisons youth, but as life goes on the character becomes more placid, there is greater disposition and capacity to enjoy the present and to look towards the future with calmness and courage. Nor is it true that the fear of death

embitters the latter part of life ; in health the prospect of death is not present, and in sickness it is looked upon as a release. It was in the mouth of a young man that Shakespeare put the words—

> "The weariest and most loathed worldly life
> That age, ache, penury and imprisonment
> Can lay on Nature is a paradise
> To what we fear of death."

It is not death which, coming in due time, rounds off like sleep our span of life, but decay and failure of mental and bodily powers which we may rightly dread and do our best to postpone. The loss of youth with its exuberance is compensated to a considerable extent by the assured powers of middle age, and no man feels disposed to complain so long as there is no abatement of his vigour. Even when we can no longer run upstairs three or four steps at a time age is not without its advantages. Cicero makes Cato give an enumeration of some of these. He places first the release from the dominion of our passions ; then the growth of prudence and the increased respect accorded to the wisdom of old men as counsellors : he points to the achievements of the aged—to Sophocles, who in his old age wrote "Oedipus in Colonus," to himself (Cicero), who learnt Greek, and to Socrates, who acquired the art of playing upon the lyre.

So long as the mind remains strong the loss of muscular strength is unimportant. Even the orator may retain the melody of his voice and the grace of his gesture if their strength has gone. Cicero would do nothing to anticipate old age, but urged regular and continuous exercise both of body and mind, and claimed that dotage is the lot of those only who have trifled away their manhood in idleness and folly. He was no enemy to modest and temperate gatherings

of friends for dinner and conversation; indeed, he considered that advancing age increases the pleasures of such meetings for social and friendly intercourse. Nor is old age any obstacle to the enjoyment of the country, to the pleasures of farming and gardening, of feeding cattle and the rearing of bees, while there are certain sedentary games in which old people may indulge although they are by no means essential to a philosophical old age. He saw no necessary connection between old age and those faults of petulance, moroseness, and avarice which are said to be its failings, for "not every sort of temper nor every kind of wine turns sour with age." Lastly, why should death alarm us? If it means extinction it is nothing. If immortality, what is there to fear? Moreover, death is as likely to occur to the young as to the old. In fact, the attainment of old age is the exception; the young desire to attain to it, and the old have reached the goal. It is natural to die; death in old age is like the slow burning out of a fire or the dropping of ripe fruit. Our dissolution is a passage into a secure haven, a happy repose after a long voyaging. There is no fixed boundary to life, and so long as a man can perform those offices which are suited to his season he should be content and remain perfectly indifferent as to its continuance. If duty demands it, we should be prepared to give up what must after all be only a short existence. Yet life must not be thrown away; suicide was forbidden by Pythagoras, who held that we should not quit our post of life without being authorized by the commander who placed us in it. When we see the contempt of death commonly exhibited by the raw illiterate peasants who serve in our armies, why should reasonable and philosophical old age tremble at its approach? The pursuits and

pleasures of each period of life become at last wearisome, and when there is no longer any relish remaining in them death is a mature and reasonable event. The soul is imprisoned in the body, separated from the great soul of the world, but at death it takes its flight to some happier region where it will rejoin the society of the illustrious dead and those it sincerely loved and respected here on earth. The old man is approaching the goal; why should he wish to postpone the end to which his life has led him? Even if the immortality of the soul is a delusion it is a pleasant one.

The statistics of suicide might throw some light upon the question whether or not old people cling to life in spite of their misfortunes. According to the French statistics for 1910 (*La Semaine Médicale*, 1912, No. 41), the "frequency of suicide runs parallel with age, and the maximum is attained in the most advanced period of life." Suicide at all ages is two and a half times more common in France than it is in England, but our English figures do not support the statement that it tends to become more common as age advances. Not only do the numbers fall rapidly after sixty-five, but they do so in greater proportion than the decrease in the number of persons living at those ages. In France the most common cause of suicide is said to be "physical suffering," which would afford a reasonable excuse for suicide in old age, but the difference between the figures in the two countries is probably dependent upon temperament, the more patient Anglo-Saxon bearing the burden of age more stoically than his Celto-Iberian neighbour.

Although universal experience tells us that all men must die, there is a tradition that the ancients

believed this could not happen in Ireland, but that when the inhabitants of that country reached extreme old age they were carried abroad in order to allow them to enter upon their last sleep! We accept death as the common lot, and few think it worth while to ask the question why life should not be perpetual; yet it is by no means easy to answer. The lowest unicellular organisms apparently do not die, but constantly undergo subdivision, which is their process of reproduction, but there is no death of the parent as in higher types of life, or, as it has been put by Weismann, "there is no corpse." As our bodies are made up of cells which for the most part are constantly undergoing renewal, it is not quite obvious why these new cells should not maintain it in a state of perpetual repair, and apart from actual destruction of sufficient portions of organs to impair seriously their functional capacity, why the bodily machine should not go on for ever? The ordinary explanation of "wear and tear" is inadequate, as the constant renewal of cells should remove all traces of damage by ordinary use. The theory that each cell starts with a definite amount of vitality (Boy-Teissier), which is exhausted in the course of time, seems to be founded on the notion that the cells are fixed, which is not true of the majority; but even if they were so, the explanation is merely a verbal one. It is as easy to postulate a definite stock of vitality for the whole body as it is for a cell. Metchnikoff believes that the cells are gradually poisoned by the toxins to which they are exposed, and that these are formed in the bowel, but he does not explain why it is that they are innocuous for forty or fifty years and then become capable of producing such serious results. On the other hand, if the toxins are not produced in the first fifty years

of life and only then begin to be formed, their appearance may equally well be the result as the cause of the changes of advancing age. That there should be a fixed period for the life of an animal is no more and no less strange than that there should be a fixed limit to its size. Why is it that an animal of certain species grows only to a certain height, has limbs of a certain average length, and a body of a certain average weight? These are determined by something which is inherent in the organism and which has been determined in the course of evolution. That is the conclusion to which Weismann arrives in his philosophical essay on this question. He thinks that death is a secondary adaptation and not a primary necessity. The unlimited existence of individuals would be a luxury without any corresponding advantage, while the persistence of more or less damaged individuals would be not only useless, but would be harmful, as they would occupy the place and take the food of more efficient individuals. Dr. Alfred Wallace wrote, "If individuals possessed indefinite power of repair, reproduction, and vitality, they would increase to such an extent that they would interfere with one another; food would become scarce, and in the struggle for existence the less favourably circumstanced would perish. Thus by natural selection old age, decay, and death might be established as the best way out of this difficulty." This is a sort of explanation, but it leaves the question why the constant production of new cells does not maintain a perpetually youthful body unanswered and the problem for the present insoluble.

Sir James Paget considered "that the exercise of the vital functions tends naturally to decay and their decay to death," but for the greater part of life

the use of our organs leads not to decay but to growth or hypertrophy, while atrophy is the consequence of disuse, and we are still left to wonder why after a certain age this law no longer holds good. There are some tissues which undoubtedly wear out and are not renewed, as, for example, the teeth, and it might be plausibly argued that the loss of these structures with consequent impairment of the functions of digestion and absorption is the first step in the course of decay that leads to the grave; but there have been many examples of healthy old persons whose digestion seemed excellent although they had lost all their teeth and did not use artificial substitutes; this was the case with Miss Joanna Hastings, to whom reference will be made. Moreover, dental skill supplies substitutes which appear to be thoroughly efficient or are at least not so inferior to the natural dentures as to affect the digestive and assimilative functions. It is true that we possess little power of regenerating highly differentiated tissues when these are destroyed, as, for example, a wound of the skin heals by a scar which contains neither hair follicles, sweat ducts, nor sebaceous glands, is inelastic, of low vitality, and liable to degenerate, yet the cells of our bodies are not the same as those we started with in infancy; they are infinitely more numerous, and where they are superficial we can watch the process of their shedding and renewal. Some attribute the cause of the gradual failure of cellular vitality to diminished blood supply, but atheroma and arterio-sclerosis are not invariable accompaniments of old age, and if they were we should be no nearer the explanation of the onset of decay; it would only be shifting the problem to that of the cause of these vascular changes. We should have then to ask why do the vessels

maintain their integrity for a certain number of years and then begin to degenerate ?

Such theories as that of Lorand, who attributes old age to thyroid insufficiency, and of Husnot to suprarenal hypertrophy and adenoma, lack sufficient anatomical foundation, but if this were forthcoming it again would only transfer the problem without answering it. We should still have to inquire why these glands undergo these changes after a certain number of years. As to the state of these glands, it may be recalled that the investigations of Weinberg at the Pasteur Institute showed the thyroid of an old man of eighty to be normal, as were also the thyroid glands and suprarenal capsules of old animals. There is no real explanation in Flourens' Law of Life even if it were true ; his law is that life lasts five times the period of attaining maturity, and he fixes the latter by the time at which the epiphyseal cartilages have ossified. There are, however, too many exceptions to this rule, and even if it could be established as universal there is no magic in the number five. In fact, it would be going back to the mysticism of the Arabs, to whom we owe the origin of the idea of the grand climacteric. The grand climacteric ages of a man, according to the superstitions of the Greeks and Arabs were sixty-three and eighty-one, but these notions were founded upon the magical properties of nine and its multiples. Sir Henry Halford described " the climacteric disease," but his cases were probably nothing more unusual than chronic Bright's disease, then seldom recognized. Some find the cause of old age in activity, and think the more active the animal the sooner it dies, yet these would be puzzled to explain the long duration of life of many birds, *e.g.* ravens and parrots. While others look to the opposite condition

of sluggishness or passivity, yet we find an exception to their rule in the long lives of reptiles. Again we are told that carnivorous animals die soon, yet this is not true of carnivorous reptiles and birds, crocodiles, and ravens.

So we come back to the position that in the present state of our knowledge the phenomena of decay and death are beyond our means of explanation except as adaptations of the organism to the environment in which it is placed.

Senility is not identical with old age; it is quite possible to be old without being senile. Old age implies merely the lapse of time, but senility indicates deterioration of structure. In old age it must be allowed that there is always diminished power of repair, while work produces a greater feeling of fatigue and restoration from fatigue takes place more slowly. Senility or deterioration of the structure of the body is undoubtedly for the most part the effect of poisons, either the poisons of infective diseases or auto-genetic poisons formed in the bowels or tissues or poisons that are ingested or inhaled. When we consider that most of the examples of extreme old age come from the poorest classes in society, the effects of hard work and insufficient or improper food may evidently easily be exaggerated. At the same time it is quite true that our working classes do age prematurely, but it is probable that alcohol and syphilis, bad air, and overcrowding are more important factors in producing this result than excessive bodily exertion.

There is reason to believe that certain races live longer than others, and undoubtedly inhabitants of temperate climates live longer than tropical races. Humphry pointed out that old age is a product of

civilization because the savage when his strength decays cannot live. Moreover, civilization provides pensions for those who are too old to work, and by the cultivation of the humaner feelings has made the maintenance of the aged a duty which is generally cheerfully performed. But the savage is free from most of the diseases which attack civilized man, and consequently that state of society in which there is enough civilization to temper the lot of the aged and not enough to corrupt the young is the most favourable for the attainment of a long life.

In the accounts of old age which we meet with in literature it is more common to find it described under the form of senility and its disadvantages pictured in vivid terms. Thus Burns wrote in "The Winter of Life" —

> "But my white pow—nae kindly thowe
> Shall melt the snaws of Age!
> My trunk of eild but buss and bield
> Sinks in Times' wintry rage,
> O, Age has weary days
> And nights o' sleepless pain!
> Thou golden time o' youthful prime
> Why comes thou not again?"

Yet, as Rauzier says, truly old age is an enviable period of existence if it is physiological, and if we were wise we could easily guard against the dangers that beset us. "Few know how to grow old," wrote La Rochefoucauld, and in consequence few attain it.

Swift has drawn a dreadful picture of senility in his account of the Strulbrugs, beings who could not die, but who had lost their youth, their hair, their teeth, and their comeliness, but lived on indefinitely. He added a cruel element to their fate by depriving them at a certain age of their property, so that they only continued to exist as pensioners upon a pittance

assigned them by the State. Cicero recognized that the possession of wealth mitigated greatly the misfortune of old age, and it is possible that Swift added this touch in order to show that life bereft of all that makes it worth having is only a burden and a misery.

> "Hard choice for man to die or else to be
> That tottering, wretched, wrinkled thing you see,
> Age then we all prefer; for age we pray;
> And travel on to life's last lingering day,
> Then sinking slowly down from worse to worse
> Find Heaven's extorted boon our greatest curse."

A cheering thought as we advance in life is that many illustrious examples show the possibility of conserving the intellectual and moral character to a great age. Isaac Disraeli said that there has been no old age for many men of genius; Titian and Michael Angelo among artists, Voltaire and Littré, Goethe and von Ranke among literary men, Palmerston, Thiers, Beaconsfield, and Gladstone among statesmen, Wilks and Paget in the medical profession, testify to this, and there is reason to believe that not only is advanced age consistent with mental activity of a high order, but that such mental activity tends to the preservation of the body and makes for happiness as well as for longevity. The advice of Cicero is sound, that "old men of all things should especially be careful not to languish out their days in unprofitable idleness."

It may be said that many men are compulsorily retired from those duties which have been their chief sources of pleasure and activity during their days of vigorous manhood; if so, all the more need to cultivate some other subject of interest—call it a hobby, if you will—to which in his declining years

a man may turn for occupation of body and mind, and here again the lesson is impressed upon us that the happiness of old age depends upon the way in which we have spent the years that have gone before it.

The survival of human beings to upwards of a hundred years is a rare occurrence, but it undoubtedly does occur. There is abundant justification for scepticism in regard to many of the cases that were recorded in former days, the only available evidence of age in those instances being the alleged recollection of events that had happened a hundred years or more previously. The most celebrated case of all was that of Thomas Parr, who died in 1635, and whose body was examined by William Harvey; he is stated to have lived a hundred and fifty-two years and nine months, but the evidence is unsatisfactory. We are told that his memory was greatly impaired, that "he scarcely recollected anything of what had happened to him when a young man, nothing of public incidents, or of kings or nobles who had made a figure, or of the wars and troubles of his earlier life, or of the manners of society, or of the prices of things—in a word, of any of the ordinary incidents which men are wont to retain in their memories." Henry Jenkins, who died in the reign of Charles II., claimed to have been at the battle of Flodden, and to have reached the age of a hundred and sixty-nine, and the Russian Czostan who died in 1724 at the alleged age of a hundred and twenty-five, are cases about which scepticism is not unreasonable, as there is no trustworthy direct evidence in their favour, and their credibility is contradicted by all recent experience. But there seems to be reason to believe that it is more common in Russia for individuals to exceed a hundred years,

for, putting aside the earlier cases of which many are to be found recorded in the *British Medical Journal* for 1886 and 1887, at the recent celebrations in St. Petersburg of the centenary of the Battle of Borodino (1812), eight contemporaries of the battle were discovered to be alive; one was a retired sergeant-major who had served in the 53rd Volhynia regiment and was alleged to be a hundred and twenty-two years of age. A more interesting case was that of Peter Laptieff, aged a hundred and eighteen; according to his story, he had climbed into a tree from which he saw Napoleon and his army pass by, but he was discovered, taken prisoner, and next morning brought before Napoleon, who was sitting on a balcony and drinking coffee. He was compelled to act as a guide to the army, but after marching for thirty-five hours he escaped, and subsequently joined the national militia, with which he fought in the general uprising against the invaders. According to the *Daily Telegraph* (Thursday, September 19th, 1912), he retained a remarkably clear memory. Another apparently authentic case was that of a woman named Mary Popoff, who was present in Moscow when the French entered, and remembers seeing the city in flames. We may also accept the cases of two survivors of the Greek War of Independence (1825–27); Commandant Heliopoulos, who died in 1906 at the age of a hundred and six, and Surgeon-General Apostolos Mavroyeni, who died at the age of a hundred and eleven. *The Lancet* has recently reported (September 7th, 1912) the case of M. Pierre Schamel-Roy, still living; he is said to have been born on August 25th, 1807, and to have seen Napoleon frequently as he was the playfellow of the King of Rome in the gardens of St. Cloud; he has a vivid recollection of Napoleon,

especially of his "mauve-coloured eyes." He saw him last in 1814. M. Schamel-Roy was at the date of the report still alive and hearty and in full possession of all his senses. Of other persons who have exceeded a hundred by a few years there are many examples, one of the most carefully recorded being that of Miss Joanna Hastings, a sister of Sir Charles Hastings, the founder of the British Medical Association. She was born at Sutton Coldfield, near Birmingham, on March 14th, 1782, and died on March 12th, 1886, just short of completing her hundred and fourth year. The year before she died she was described by Sir George Humphry as being deaf and unable to walk, but in good condition, happy and full of interest in passing events; she never seemed to contemplate death, and always said to visitors, "Next time you come to Malvern you must come to see me." She had never worn artificial teeth, and only took to spectacles at the age of ninety-seven; at the time of her death cataracts were developing in her eyes.

Professor Chevreuil, of the "Faculty of Medicine of Paris," lived to be over a hundred, and was a remarkable example of the way in which the mental powers may be retained to a very advanced age.

One of the most renowned of centenarians is Luigi Cornaro, a noble Venetian born in 1466, who died at Padua on April 26th, 1566. Having attained the age of eighty-one in sound health and strength, he wrote a short tract entitled, "How to Regain Health and Live a Hundred Years"; he published three subsequent editions, to which he contributed further chapters, one at the age of eighty-six, a second at the age of ninety-two, and a third at the age of ninety-five. We are told that having attained the age of a hundred years, he died "without pain or agony and

like one who falls asleep." His little book is a model of practical wisdom, and contains in principle all that is needed to enable any one to attain to a healthy old age; it is more than likely that it was known to Milton and supplied the doctrine of Michael's speech. He tells us that when he was between thirty-five and forty he found himself in such unhappy circumstances from his former intemperate mode of life, suffering from colic and gout; almost continual slow fever, a stomach generally out of order and a perpetual thirst, from which disorders the best delivery he had to hope for was death. Having tried everything that could be thought of to gain relief but to no purpose, he was told by his physicians that the only alternative left him was to live a strictly sober and regular life; that there was no time to be lost, and that unless he would adopt it he must resign himself to death. His stomach was in such a condition that he was advised to use "food solid or liquid such as is generally prescribed to sick persons, and both sparingly." The consequence was that in a few days he began to perceive that such a course agreed well with him, and by pursuing it he found himself in less than a year entirely freed from all his complaints. He then set himself to discover what kinds of foods suited him best, and soon convinced himself that his palate was no safe guide, so that he gave over the use of such meats and wines as did not agree with him, taking only so much as he could easily digest, having strict regard to quality as well as quantity, and always rose from table with a disposition to eat and drink more. In addition to this abstemious mode of life, he carefully avoided, as far as possible, all extremes of heat and cold, extraordinary fatigue, interruptions of his usual hours of rest, and staying long in bad air.

So far as lay in his power, he tried to avoid melancholy, hatred, and other violent passions, and although he was not able to guard so well against these disorders, he discovered that these passions have no great influence over the bodies of those who are governed by his two rules of eating and drinking. Moreover, he found himself able to stand exposure to heats and colds and disagreeable changes of weather without taking harm, while he passed through serious financial troubles, involving expensive lawsuits commenced against him by great and powerful men without being greatly disturbed in mind, and finally obtained a decree exceedingly favourable to his fortune and character. When he was seventy years of age, the coach in which he was travelling was upset and dragged a considerable distance before the horses could be stopped. He suffered from many shocks and bruises, his head and body were terribly battered, and a leg and an arm were dislocated. When the physicians saw him they wished to try bleeding and purging to prevent inflammation and fever, but he refused to be either bled or purged; he caused his arm and leg to be set and suffered himself to be rubbed with certain oils said to be proper for the occasion; using no other kind of remedy, he recovered without feeling any bad effects from the accident. Hence he concludes that "he who leads a sober and regular life and commits no excesses in his diet can suffer but little from mental disorders or external accidents." As a proof that the quantity of food is of primary importance, he relates how, being urged by his friends and relatives, he increased the quantity of his food although he was of opinion that as he was getting older and his stomach getting weaker he should have rather lessened the amount than added to it, yet not wishing

to appear obstinate or to know more than the physicians themselves, but above all to please his family, he consented to enlarge his diet so that whereas previously what with bread, meat, yolk of egg, and soup, he had as much as twelve ounces he now raised it to fourteen ounces, and whereas he drank before fourteen ounces of wine he now took sixteen ounces. This addition, he tells us, had such an effect that from being cheerful and brisk he began to be peevish and melancholy, and on the twelfth day he was attacked with violent pain in his side which lasted twenty-two hours, and was followed by fever, which continued thirty-five days, from which, however, he recovered, more than ever convinced of the necessity of adhering to smaller quantities of food. With regard to diet he does not pretend that what suited him would suit every one; he believed that any man can acquire by careful observation a perfect knowledge of his own constitution and of the kinds of food and drink which agree with him best; but for this repeated trials are necessary, as there is a great variety in the nature and stomach of individuals. He found old wine did not suit him, and that new wine did, and that many things that might not be injurious to others were not good for him. He says, very wisely, that no physician could have given him this information, yet he by no means disparages the value of medical advice, although for the bare purpose of keeping ourselves in good health he was of opinion that we should "consider a regular life as our physician, since it preserves men, often those of a weak constitution, in health, makes them live sound and hearty to the age of a hundred and upwards, and prevents their dying of sickness or through the corruption of their humours, but merely by the natural decay which at the last

must come to all." He did not hold it necessary that all should eat as little as he did or should not eat many things from which he abstained, but they should not eat of any food or in greater quantity than that which agrees with them best and which their stomachs can easily digest. The same is to be understood of drink. The only rule for such persons to observe in eating and drinking is the quantity rather than quality, but for those who, like himself, are weak of constitution they must not only be careful as to quantity, but also of quality, partaking only of such things as are simple and easy to digest. He affirms that "a man of bad constitution who leads a strictly regular and sober life is surer of a long one than he of the best constitution who lives carelessly and irregularly," and he ends by a eulogy of "that divine sobriety, the friend of Nature, the daughter of Reason, the sister of all the virtues, the companion of temperate living, modest courtesy, content with little and perfectly mistress of all her operations; from her as from their proper root spring life, health, cheerfulness, industry, learning, and all those actions and employments worthy of noble and generous minds. Her influence is so sure as to promise to all a long and agreeable life, and lastly she promises to be a mild and pleasant guardian of life, teaching how to ward off death. Strict sobriety in eating and drinking renders the senses and understanding clear, the memory tenacious, the body lively, its movements regular and easy, and the soul feeling so little of her earthly burden experiences much of her natural liberty; the mind thus enjoys a pleasant harmony, there being nothing in the system to disturb, for the blood is pure and runs freely through the veins, and the heat of the body is mild and temperate."

In his second tract he tells how not only had he lost his former ailments, but his character had improved, as he was "formerly of a most irritable disposition, inasmuch as at times there was no living with him." At the age of eighty-six all his senses continued perfect – his teeth, voice, memory, and heart; his brain was clearer than it had ever been, nor had his powers abated as he advanced in life, and this because as he grew older he lessened the quantity of his solid food. Over and over again he returns to this point of quantity. "The fact is," he says, "large quantities of food cannot be digested by old stomachs." He advises that while food is lessened in quantity the meals should be more frequent; that formerly he ate twice a day, but now he ate four meals, men at his age becoming children again who eat little and often during the twenty-four hours. He tells us that at the age of eighty-six he lived on bread, panado, yolk of eggs, and soup; of flesh meat he ate kid and mutton, poultry of every kind, and sea and river fish; he says nothing about vegetables or fruit, but we may presume that he continued to take his fourteen ounces of wine daily.

Writing in his ninety-fifth year, he reaffirms all his former principles, saying that he found himself sound and hearty, content and cheerful, although he was "born feeble and with an infirm constitution," so that he "fears he shall not outlive a hundred years." All his senses were as good as ever and in the highest perfection, "my understanding clear and bright, my judgment sound, my memory tenacious, my spirits good, and my voice has grown so strong and sonorous that I cannot help chanting aloud my prayers morning and night, instead of whispering and muttering to myself as was formerly my custom."

The case of Cornaro may be accepted without question as he was well known to his contemporaries, his tracts drew attention to his condition, and his long and healthy life was commonly regarded with wonder and admiration, although few were found to follow his precepts.

Out of the fifty-two cases collected by Sir George Humphry in only eleven was the age confirmed by baptismal records, which illustrates the want of precise evidence which appears to satisfy the majority of persons who bring forward cases of this kind.

In the seventy-third annual report of the Registrar-General (1910) there is a valuable table giving the deaths in England and Wales at each year of age from 0 to 100 and over. Of those who were registered as having attained a hundred years or more there were 65, of whom 22 were males and 43 females. It would be interesting if, whenever a medical man is called upon to give a certificate of death for a patient who is stated to be over a hundred years of age he would inquire into the evidence that exists of the age of the patient, and, further, if the Registrar-General would give the particulars in these cases where the claim is supported. The excess of female centenarians over male is not peculiar to this table, but only illustrates the general rule. Thus, in Sir George Humphry's book, in which he quotes the Registrar-General's report for 1873, of 89 persons dying at or over the age of a hundred only 10 were males, and he thought that women possessed inherently more vitality, instancing the fact of the greater mortality among male babies. In his cases 12 of the 52 investigated were the first children of their parents, a fact which so far as it goes is in opposition to the popular belief that first children have not such good constitutions

as those born subsequently. Favourable qualities for the attainment of extreme old age appear to be sparseness of habit, a well-developed osseous and muscular system, a sound family history, good digestion, regular action of the bowels, active habits, the capacity of sleeping well and eating well. As a rule, these aged persons have taken little alcohol or meat, their hair has retained its colour or at least is not white, their sight and hearing have been relatively good, and they have not suffered from joint troubles.

The belief in the possibility of attaining an age much exceeding that which experience shows to be usual has not only been popular, but has been shared by some great philosophers. The celebrated Roger Bacon believed in the possibility of life being prolonged for a thousand years, and in his address on the Founder of the Medical School of Trinity College, Dublin, Dr. Mahaffy informs us that Stearne (1624–1669) held "there was no reason why human life should not be indefinitely prolonged under favourable circumstances, with proper hygiene, and as a docile son of the Church he defended not only the continued existence of the Tree of Life, but that other text of Genesis which gives huge lives of several centuries to the patriarchs before the Flood. He saw no reason why men of his own day should not be made to live as long, but his mathematical leanings induced him to believe that the lives of the patriarchs must even then have been exceptional, otherwise he foresaw that during the time between the Creation and the Flood, which he assumed to be fourteen hundred years, had the average age of mankind been four hundred years, and had they begun to beget children at the age of ninety, and had done so at the rate of one male every three years, the population of the

earth would not have found standing room on its surface. He applied to Miles Symner, the ex-Cromwellian captain, at that time Professor of Mathematics, to make the calculation, and the result was to show that while the solid part of the globe was computed at the colossal number of sixteen figures of cubic feet, beginning with fifteen, the population would also require sixteen figures beginning with 16."

Although in modern times no one has been found to share these exaggerated hopes, many modern writers, of whom perhaps Metchnikoff is the best known, take a sanguine view of the possibility of prolonging life by adopting suitable means. But it should be remembered that the seeds of decay are often sown in early or middle life, and that those who wish to live long must take their measures in good time and avoid those evils whose effects only become manifested in later years. Such teaching is not likely to be widely followed; the average man wishes to live his life as he pleases, and then to find some remedy later on which will repair the damage he has done to his body and give him a new lease of life. This unreasonable demand is not possible of fulfilment, for although something may be done to patch up the body and to help it to hold together for a few more years, it may be laid down as incontestable that those only may expect to live to extreme old age who at the age of sixty possess bodies free from organic disease. There have been various means recommended for attaining old age, some magical, many quackish, others rational. According to the Cabalists, the Angel Uriel took pity on Adam when he was driven out of Eden and gave him a branch of the Tree of Life which enabled him and his descendants

to attain the extreme limits of old age, but unfortunately this precious branch was lost during the confusion occasioned by the Deluge. The broth of Medea was made from the liver of stags and the head of a rook whitened by nine hundred years of life, the second ingredient being somewhat difficult to procure.

In some parts of France there was formerly a custom of covering a newly born infant with salt in order to conduce to longevity; the salt was allowed to remain on for two or three days, and then was washed off with wine and water. The academician St. Aulaire was so treated as an infant, and undoubtedly lived to be very old. Pythagoras regarded honey as conducive to long life, and, according to Hufeland, the Egyptians prescribed courses of emetics with the same object.

Contact with young healthy persons was formerly believed to possess the power of restoring vitality to the aged, and was constantly practised in ancient times, a well-known example being that given in the Bible in the case of David when he was very old. As the blood was believed to be the source of life, it was thought that the introduction of the blood of a young and healthy person would restore youth, and it is said that for this purpose Louis XI. of France had a young man killed in order to drink his blood. This idea led to attempts at transfusion, but the technical difficulties could not be overcome, and there were so many fatal accidents that it was abandoned. Lord Bacon considered that sweating should be avoided by every means, and Harvey regarded acids as most undesirable, while Stephen Blanchard extolled sal volatile. Among rational remedies a distinguished place should be given to the Elixir of Villars, which was popular in Paris in 1728, until it

was shown to consist only of spring water, but it was an essential part of the treatment that while the elixir was being taken the patient should abstain entirely from all alcoholic drinks! Hippocrates recommended merely good air, baths, friction and physical exercises, while F. Hoffman enjoined the avoidance of all excesses; to respect old habits even if bad; to breathe pure air; to use suitable food; to avoid drugs and doctors, and to maintain calmness of mind and a contented spirit. In connection with the last part of these injunctions the saying of Fontanelle may be recalled: "Pour vivre longtemps deux choses sont surtout nécessaires à l'homme; Une bon estomac et un mauvais cœur."

Decidedly preferable in feeling and expression are the lines which Milton puts into the mouth of the Archangel Michael—

> "But is there yet no other way besides
> These painful passages how we may come
> To Death and mix with our conatural dust?
> 'There is,' said Michael, 'if thou well observe
> The rule of *Not too Much* by temperance taught,
> In what thou eat'st and drink'st, seeking from thence
> Due nourishment, not gluttonous delight,
> Till many years over thy head return,
> So thou may'st live till like ripe fruit thou drop
> Into thy mother's lap, or be with ease
> Gathered, not harshly plucked, for death mature.
> This is Old Age.'"

There is a wonderful similarity in the rules laid down by those who have attained a considerable age. Thus, Mr. Frederick Harrison, who has recently passed his eighty-first birthday, gave a representative of the *Daily Mail* his "five golden rules of health," which are (1) "to abstain from tobacco, spirits, made dishes, and all such terrible things; (2) rise from a meal with an appetite; (3) walk every day for two

hours; (4) sleep eight hours; and (5) be content with what you have got."

Lord Strathcona, who is ninety-two and is undoubtedly one of the most remarkable instances of mental and bodily vigour preserved to an advanced age, agrees with these rules. He has not smoked for seventy years, and thinks most people eat too much. For many years he has only taken two meals a day, breakfast and dinner; he eats little or no meat, and he attaches great importance to exercise, yet he makes a rule of not sleeping longer than six hours. The *British Medical Journal*, in noticing these statements, adds that Tolstoi, the grand old man of Russia, taught that the secret of long life is to be found in fresh air day and night, daily exercise, moderation in eating and drinking, one hot bath weekly and a cold one daily, comfortable and not over heavy clothes, a dry, spacious, and sunny dwelling, scrupulous cleanliness, and regular work; he adds that night was intended for sleep, and the chief condition of good health is a life overflowing in labour and ennobled by good actions.

Moltke, in his ninetieth year, said he maintained his health by great moderation in all things, by regular outdoor exercise in all weathers. The journal concludes its article by quoting with approval the famous Regimen Sanitatis of Salerno—

> "Si vis incolumen, si vis te vivere sanum,
> Curas tolle graves, irasci crede profanum,
> Parce mero, coenato parum; non sit tibi vanum
> Surgere post epulas; somnum fuge meridianum;
> Ne mictum retine, ne comprime fortiter anum.
> Haec bene si serves, tu longo temporo vives,
> Si tibi deficiant Medici, medici tibi fiant
> Haec tria; mens laeta, requies, moderata diaeta."

All authorities alike preach the doctrine of

abstemiousness. The celebrated Prussian historian, Leopold von Ranke, who continued his work with almost undiminished vigour until his death at the age of ninety-one, according to the account published by his son, General F. von Ranke, rose about eight o'clock and took only one or two cups of tea, with nothing to eat; he worked in his dressing-gown and slippers, standing at his desk until eleven, when he dressed and went to the University, where he lectured from twelve to one; after his work there and at the Historisches Seminar on Thursdays, he took a solitary walk in the Thiergarten. "Returning home as hungry as a wolf, he mounted the stairs at a run, and dinner had to be served at once." His food was plain, and he never drank more than one or two glasses of white wine. After dinner he worked again until seven, when he took a cup of tea with his family, then work again until eleven, after which he spent some time talking with his wife; he slept for seven or eight hours. This was the laborious life passed by a man who was no giant in strength, but possessed only "a small insignificant body."

The octogenarian, Sir Hermann Weber, in 1903, delivered a lecture at the Royal College of Physicians on the means for the prolongation of life. Like Luigi Cornaro, he relied on his personal experience, but while Cornaro lays down one or two general principles and recognizes that the details must be adjusted to suit individuals, Sir Hermann gives us his own practice as a rule to follow. He tells us that he had not a good heredity, his father dying in his sixtieth year and his mother before sixty. He believes that he has escaped their fate by moderation and abundant exercise. He takes a daily walk in all weathers, and once a week a long walk of four or six hours, and once

a year he goes for a walking holiday. He recommends mental occupation, gardening, intellectual games, and travelling in order to keep up interest, but wintering on the Riviera for the sake of the climate. In addition to walking, he advises daily muscular exercises, especially of the respiratory muscles, from three or five to fifteen minutes once or twice a day. He believes in the rule early to bed and early to rise, and allows not more than six or seven hours' sleep; he uses a daily bath with friction of the skin, is a great advocate for regular work and mental occupation, and believes that the aged should stimulate their sense of enjoyment of life. They should cultivate mental tranquillity and hopefulness, avoid grief, and study to control their passions. He recommends the avoidance of alcohol and other stimulants, of narcotics and of soothing drugs.

Sir Hermann Weber is a convinced supporter of Metchnikoff's doctrine of the harmfulness of the absorption of toxins from the large intestine, and considers that the uselessness of the colon has been proved, but as its removal or exclusion is out of the question and its disinfection by antiseptic drugs a failure, some means must be found to prevent intestinal putrefaction. Fasting reduces the number of microbes, but prolonged mastication (Fletcherism) has not the same effect, for ruminating animals have the most extensive flora; eating raw food increases the number of microbes in the intestine, while he gives many instances of the harm done by eating food that has undergone putrefaction. In this argument he leaves out of account the undoubted sterilizing action of the stomach; where putrid food does harm these effects are more likely to be the result of toxins which have been formed before ingestion

than of the microbes that are swallowed. He recognizes that all acids prevent putrefaction and kill microbes, and it is of course possible that in old age if the secretion of gastric juice is deficient the protective influence of the stomach may be less than in adult life. As an aid to this effect of the gastric juice, he recommends the use of sour food, such as sauerkraut, sour milk, and "kwass," which is a fermented liquid made from rye bread, containing not only alcohol, but lactic acid; he says that rye bread contains lactic acid, but so does all bread, although rye bread may contain more than ordinary wheaten bread. Finally, he recommends the use of milk soured by fermentation with Metchnikoff's Bulgarian bacillus as being one of the pleasantest and most efficient means of diminishing intestinal putrefaction.

The popularity of Metchnikoff's theory is much more due to its being some sort of an explanation which suggests a prophylaxis than because of its soundness. His argument is that the colon in man is a useless organ, fulfilling no function of digestion or absorption which has developed in mammals as a reservoir "to enable them to run for long distances without having to stand still for defæcation," although those mammals which seek safety in flight do not "stand still" to defæcate. However, he goes on to say that in this reservoir microbes develop, and that the consequence of fæcal retention is the production and absorption of fæcal toxins, yet Schmidt and Strasburger have proved that the fæces of constipated persons contain few microbes; nevertheless, he asserts that "the cause of the evil is the multiplication of microbes in the contents of the large intestine" (pp. 68, 69), and, again, that "it is a just inference

that the duration of life of mammals had been notably shortened as a result of chronic poisoning from an abundant intestinal flora" (p. 72). There is no evidence that constipated persons live shorter lives than those who are not; women admittedly suffer more from constipation than men, yet Metchnikoff says (p. 4) that "women live to a greater age than men."

As to his assertion of the connection between longevity and the use of sour milk, it is at best unproved. There are no means of determining with certainty the age of people in Bulgaria, and neither external appearances nor family statements are trustworthy bases for conclusions of such far-reaching importance. The sour milk regimen is useful in some cases of chronic constipation, is worth trying in mucous colitis, but as a prophylactic of senile changes its value is quite undetermined. If it were to come into fairly general use in the course of the next fifty years, a sufficient body of experience might then be accumulated to enable an opinion to be expressed. At present it is merely the suggestion of an eminent man whose reputation has been gained in a different field of scientific work.

Confirmation of the opinion that there is no necessary relation between the regular evacuation of the bowels and longevity is afforded by a letter signed "M. C. W." in the *British Medical Journal* (November 9th, 1912, p. 1348), which tells how the writer's grand-aunt "never had taken and never would take an aperient. She was a spinster in good circumstances who led an active life and lived very sparingly. She would often go as long as six weeks without an evacuation, and if at the end of that time she felt uncomfortable she would put on a leech

over the liver and this always relieved her. Of course all this ought to have killed her, but inasmuch as she was ninety-eight when she died, I do not think it did."

Sir George Birdwood, who has spent half his life in India, writes to *The Times* (December 9th, 1912) to deprecate the desire to prolong life except in the interests of others, and to thank God that abnormal ages of eighty, ninety, and a hundred are not to be achieved by any rule of diet or conduct, but are and always will be exceptional. He holds that for one man on his own experience to lay down rules for others is nonsense. His "oldest and healthiest acquaintance, one of the sanest and healthiest of men, drank a bottle of the best Cognac every day of his life and apparently was always the better for it." He does not believe in overwork, but denounces over-eating, and writes of the "bestial orgies," in which Britons indulge at their "evening banquets," likening them to those of the Etruscans which choked the "artistic spirit" which is "the soul of religion, poetry, and art." "The sovereign prescription for health is to think as little of it as possible." In this "characteristic explosion," as the *Spectator* calls it, there is much good sense, for no man can "by taking thought" prolong his life any more than he can add one cubit to his stature, but he may by careful living keep himself in health and fitness so long as it may be given him to live, and such careful living, if it can be summed up in one word, is to be expressed in moderation, moderating our desires, our ambitions, our exercises, our food and our drink within those limits which are imposed by the gradual failure of our organs as age advances.

SENEX LOQUITUR.

"The young heart hot and restless,
The old subdued and slow."

Subdued and slow ?—ah ! No—
That is the tragic woe !
Life has been lengthened, and the baleful art
Has left a fatal hunger in the heart.
Youth is prolonged, and so
Comes on the inevitable woe.

The gods have many ways
These latter days
To torture us—no daring they deny.
Foolhardy lives we live, and strange new deaths we die ;
But woe of woes to tell
Is that we will not hear the curfew bell
Which bids us " Cover fires !
Quench the hot heart ; beat out the fierce desires,
Forego the fruitless strife
With empty-handed life ;
Bid the rebellion cease,
Possess your souls in peace ! "

But No—but No—
That is the tragic woe,
Still masquerading in the garb of youth
As if, forsooth,
Death could be cheated of his easy prey !
Still looking for a distant day
To set the seal on powers
Which *once* were ours !
Still hankering for a place
In a forlorn forgotten race ;
Still urging—striving—vying—
The sad few moments flying !
Oh ! not the fairest fables told
Of the young glories in the Age of Gold
Can pierce with such regret
As the great loss we heed not, nor forget
The grace divine and sweet of *growing old !*

K.*

* These verses by Miss Kathleen Knox were published in the *Spectator* for June 8th, 1912.

CHAPTER II

Normal Old Age

The first sign that the body has reached its full term of active development is the accumulation of superfluous fat, especially in the abdomen. This marks a diminution of metabolic activity, and should be accepted as an admonition to lessen the input of food, but as it is seldom accompanied by any decrease of appetite, the warning is usually not heeded, and the misguided men or women at middle age regard the desire for food as a sign of healthy vigour, indulge it to satisfaction, often grow obese and unwieldy, develop gout and other troubles, and while grumbling at the consequences ignore their cause or are unwilling to take measures to restore the proper balance of nutrition. They perhaps spend a few weeks annually undergoing some "cure," and for the time adhere to the prescribed regimen, deceiving themselves with the delusion that the effects of eleven months' self-indulgence can be washed away by a course of mineral waters and abstinence lasting for three or four weeks. If the meaning of this increase of fat were better understood and received due attention, the onset of old age would be more often postponed and lives would be prolonged. It is not without reason that fat people are regarded by insurance companies as bad lives, as they rarely live

to the normal age of seventy. Conversely, persons of spare habit live long, not because fat people are more self-indulgent and thin people more temperate, but because those who rapidly accumulate fat after forty show a failure of metabolic activity which is a sign of lessened vitality and of premature decay, while thinness indicates the conservation of this fundamental function, with the promise of a longer duration of life.

The second sign of waning power is presbyopia, or that change in the crystalline lens consisting in hardening of its structure and flattening of its surface, which causes lengthening of its focus and necessitates the use of spectacles. This change usually sets in about the age of forty-five, but in short-sighted people the lengthening of the focus may be only beneficial and may enable them to dispense with the spectacles they have hitherto required. The date at which it occurs, whether preceding forty-five or postponed to a later period, may be taken as a sign that the onset of decay is either premature or retarded.

Whitening of the hair, which is ascribed by Metchnikoff to the activity of certain pigment-devouring phagocytes, should be considered a much less certain sign, as its onset depends on factors or agencies which are at present unknown to us. As is well known, it occurs in some people quite early in life without being accompanied by any other symptom of decay, and there is no reason to believe that the lives of such persons are shorter than the average. Some kinds of hair, notably that which is jet black and coarse, is prone to undergo this premature loss of pigment. If we may set aside these not very uncommon cases of early whitening of the hair as exceptional, we may regard it as a rule that the change

portends decay. In many of the centenarians it has been noted that the hair has for the most part retained its natural colour.

Baldness or loss of hair from atrophy of the hair follicles is an even less trustworthy sign than whitening, for it is often hereditary and occurs long before there is any other sign that youth has passed away. It occurs more often to persons with light than to those with dark hair, and is almost confined to the male sex. Apart from these cases, we find the rule to be that after fifty years of age the hair gets thin on the vertex, the individual hairs become stiff and brittle, the scalp dry, and the use of some unguent necessary to prevent the hair looking rough, while a visit to the hairdresser has to be made more frequently in order to let him trim the ends, which tend to turn up. The hair over the body becomes scanty, thin, and weak, white or light in colour, ceases to curl, and in places disappears entirely, leaving the skin smooth, pale, and polished, especially over the fronts of the legs; on the other hand, there is in women an increased growth of hair on the face.

The nails become brittle and dry and show longitudinal ridges; they split easily, and should be dipped in water to soften them before they are cut.

The skin grows dry from diminished activity of the sebaceous glands; this dryness is attended by a disposition of the epidermis to crack or to become rough, a condition which may be prevented by the use of glycerine or cold cream to supplement the deficiency of the normal fatty matter. The sweat glands become less active, especially the odoriferous glands in the axilla genitals and feet. From disappearance of subcutaneous fat coupled with loss of elasticity the skin becomes wrinkled (*v. infra*). The

pigment of the skin fades from atrophy of the malpighian layer, but as age advances there are often formed brown patches or freckles on the dorsal surface of the forearms and hands, on the neck and cheeks. Small stellate veins disfigure the cheeks and nose, the backs of the hands, and the skin of the lower extremities, while minute vascular nævi, the size of a pin's head or larger, form in the skin of the abdomen and trunk. The skin of the feet is dry, and on the soles is often thickened and scaly. Owing to this dryness the feet of elderly people suffer from friction in walking, giving rise to burning pain, preventable by dusting them with powdered French chalk.

Although not so generally recognised, the function of hearing normally undergoes a change comparable to that of vision. According to Patenostre, who has made a special study of the subject, the labyrinth of a man of sixty is never like that of the normal adult. He finds that the anterior labyrinth is diminished to three-fifths of its normal function, while aerial audition is modified by the changes in the middle ear. Bone conduction is diminished on account of changes in the bones. The posterior labyrinth is diminished in its function by one-half, as tested by the production of nystagmus and vertigo, the latter symptom being diminished in the rapidity of its appearance, its duration and intensity, the diminution varying from a third to one-half. It may be parenthetically asked here whether this diminished tendency to vertigo explains the disappearance of the liability to sea-sickness which is one of the advantages of advancing years. In addition to the labyrinthine change there is distinct diminution in the distance at which the voice is heard, although conversation may be followed quite well. The

diminution is less marked in women than in men, and the left ear is as a rule better than the right. Thus three-fourths of the male subjects heard a whisper better with the left ear, while a third heard it six metres or more, one-third from 4·5 to 6 metres, and one-third below 4·5 metres. In women half the cases examined could hear a whisper at more than six metres, and two only below 4·5 metres. Examination with the watch gave similar results; only a sixth of the elderly people could hear the watch placed over the temporal mastoid or pre-auricular regions; five-sixths could not hear it. A tuning fork is heard by a young man for from 75 to 80 seconds, but in old age this duration is sensibly diminished, being from 40 to 70 seconds on the average, the fork being held at 2 cm. from the pinna. Bone conduction of the tuning fork showed in all cases reduction of more than 8 seconds, and there were great variations in the two ears, a condition which is not observed in the young.

It has also been observed by Loewenburg that in old age there is complete insensibility to high notes and slight deafness to low notes.

With these changes in the external appearance of the body and in the special senses there is also invariably some change in character and mentality. The temperament becomes more equable and placid, or at least less excitable and irritable than it was. In most persons there is no longer the same wish to compete, ambition is satisfied or has died out and contentment replaces the desire for wealth or fame. The recording faculty of memory is weakened, that is to say, the brain ceases to retain impressions of current events or information recently acquired with its former certainty and accuracy. Dugald Stuart

thought that this resulted from weakening of the faculty of attention, but this is doubtful, as most elderly persons who have taken notice of their own mental condition would admit that in spite of careful attention, as in reading for example, it is more difficult than it formerly was to remember what they have read. Imagination also is weakened, invention fails, the emotions are subdued, the brain reacts less promptly to external stimuli and assimilates new ideas less readily, yet retains its judgment unimpaired, or even from the greater deliberation of its mental processes acquires a higher degree of this faculty.

The muscles become wasted, pale, and undergo simple or fatty atrophy or fatty infiltration. These changes lead to great loss of weight, which begins about sixty and by eighty may amount to a stone.

The bones of the skull become denser in old age, while the bones of the rest of the skeleton become lighter, thinner, and more porous. The cancellous tissue of bone becomes yellow (fatty) from diminution of the blood supply. The spaces in the spongy portions of the bone become enlarged, the nutrient canals are obliterated while the medullary cavity grows wider and longer, reaching right up to the epiphysis (Sappey). Senile osteoporosis is the name given to the extreme fragility of bones seen in old age. There is an increase of organic matter and decrease of lime salts in the bone. The skull shows gradual disappearance of the sutures, beginning on the inner table and in the posterior sutures. The bone becomes wasted and thin and may actually be perforated. The disease is more marked in the female.

The bones of the face are altered, owing mainly

to the loss of the teeth, but the glenoid cavities become shallower.

The spine becomes curved antero-posteriorly (kyphosis), the result of absorption of the inter-vertebral discs and osteoporosis of the bodies of the vertebrae. There may be ankylosis of several vertebrae by soldering of their bodies together; this is seen most often in the atlas and axis and the sacrum and coccyx, but it may affect the entire spine. The absorption of the inter-vertebral discs leads to loss of height, in men averaging one inch, in women one and a half inches, but it may amount to three inches. It begins at the age of fifty, and goes on to the age of eighty-five.

The sternum shows ankylosis of the manubrium and xiphoid with the body of the bone.

The pelvis tends to atrophy; the iliac bones assume a transverse attitude under the pressure of the viscera, while the pubic and sacro-iliac sutures become ankylosed; the cotyloid cavities become widened, the bones fragile and predisposed to fracture.

The functional consequences of the changes in bones and muscles are chiefly difficulty in locomotion; walking and other movements become slow and uncertain, sometimes painful and stiff. Tremor is occasionally present. The electrical reactions of the muscles are diminished. The senile ectropion which is so disfiguring is due to wasting of the orbicularis muscle, which relaxes the skin of the eyelids and leads to the eversion of the lower lid, while the opening of the lachrymal duct is deviated so that the tears flow on to the cheek.

The cartilages generally become yellow, calcified, and fatty, especially those of the ribs, larynx, trachea, and bronchi. Professor Humphry thought the

calcification of the cartilages was not natural, apparently because Harvey did not find the change present in the body of Thomas Parr.

The joints show deficiency of synovia, erosion of their articular surfaces, with outgrowths of bone (osteophytes). These changes are seen especially in the knees; they are not gouty or rheumatic, but are senile.

The lungs are soft, showing loss of elasticity, are often emphysematous and pigmented; in the very aged they are frequently reduced in size, fibrosed, and show dilated alveoli from senile emphysema caused by the wasting of the blood-vessels.

The pleura presents frequently milk spots and patches of cartilaginous degeneration, while adhesions at the apices of the lungs are so common that the older anatomists called them ligamenta pulmonum, as being normal structures.

The functional changes in the respiratory system are dyspnoea and cyanosis. They are caused by the alterations in the thoracic wall, the loss of elasticity in the lungs, the weakness of the respiratory muscles, and the diminished respiratory capacity, which shrinks from 3·15 litres to 2·65; the average respiration per minute in old people is 20, showing a slight increase. Expiration is forced. According to Andral and Gavarret the amount of expired CO_2 is 808·80 grms. instead of 1072·80.

The organic changes that take place in the heart as age advances are so constant that they may be considered as normal, yet they vary in degree, and when their extent is sufficient to impair the functional capacity of the organ they must be regarded as pathological. The old heart is increased in size and weight, but its muscle has wasted, the muscular

fibres showing brown atrophy or fatty degeneration, while there is an increase of the interstitial connective tissue. The last change is a fibroid degeneration of the heart which is not inconsistent with the due performance of its function, but brown atrophy and especially fatty degeneration of the muscular fibre lead to weakening and ultimately to death from heart failure. Fatty degeneration is liable to undergo rapid increase from fever, especially fever due to infectious disease, and the risk of such diseases proving fatal in old age is greatly increased on this account.

In the late Dr. T. D. Savill's essay on senile decay, which was based on the analysis of 409 cases over sixty years of age, he gave as the normal symptoms of old age muscular weakness, senile changes in the heart and circulation, vertigo, epilepsy, and high arterial tension. He attributed all these to hypermyotrophy of the arteries occurring independently of renal disease. The changes begin by loss of elasticity in the large vessels long before any similar signs appear in the smaller ones; the changes in the latter are due to the direct transmission of the shock of the blood caused by the loss of the elasticity of the large vessels and also to previous prolonged periods of high blood-pressure. Thus he attributes senile decay generally to altered blood-pressure, and advocates the prophylactic use of small doses of nitroglycerine to prevent its ill effects.

The pericardial sac frequently shows on its inner surface patches of thickening of its endothelium called milk spots. The fibrous layers of the membrane are also thickened and are often the seat of deposits of fat and lime salts. Occasionally the pericardium may be so extensively infiltrated by calcareous matter as

to be converted into a box of stucco. The visceral layer of the pericardium shows similar thickening and milk spots.

The endocardium tends to become opaque, thickened, and calcified, these changes involving the valves, which are stiffened but not necessarily incompetent.

The aorta is usually dilated, and its intima shows widespread yellow patches of fatty degeneration or raised areas of fibroid endarteritis, with more or less extensive deposits of fatty and calcareous degeneration. The vessel has lost its elasticity, its fibrous and muscular coats are thinned, and the dilatation is the consequence of these changes, the walls yielding to the blood-pressure.

Similar changes are found in the arteries with thickening of the adventitia. The capillaries are also thickened.

The veins show loss of elasticity, giving rise to varicose dilatations, and are often the seat of attacks of phlebitis. Their coats are weakened and are easily ruptured.

The blood in old age shows a reduction of the total number of erythrocytes to about 3,600,000; the haemoglobin is proportionately diminished, while the polynuclear leucocytes are relatively increased. There is a slight increase in the amount of urea, from 0·017 to 0·019 per litre.

The **functional** disturbances produced by weakening of the heart are dyspnoea on exertion, slight oedema of the ankles, and increased sensitiveness to external cold. The pulse becomes more frequent and more variable, showing more definitely the influences of exercise, rest and position; it is full, and the tension is usually 160 mm. of mercury or about 20 mm. more

than in adult life. Coldness and cyanosis of the extremities are commonly present.

The lymphatic glands are usually atrophied.

The spleen is generally found reduced in size, but is occasionally enlarged and hard, with cartilaginous plaques encrusted with lime salts in its capsule; it is questionable, however, whether these changes are senile; they are more probably the result of some antecedent attack of perisplenitis. On section the organ is paler than normal, and there is some wasting of the malpighian corpuscles.

The thyroid gland is said by some to be reduced in size, dark in colour, its connective tissue being increased while the colloid material is diminished. According to Weinberg (*op. cit.*), who examined the thyroid of an old man of eighty at the Pasteur Institute, the gland was normal.

According to some authors the cortex of the suprarenal capsules is diminished; fatty nodules are found embedded in it and also small adenomata. Cavitation of the centre of the gland has also been described. On the other hand, Sabrazes and Husnot (1906) have described these glands as hypertrophied, and Josué has based on this his explanation of the increased arterial tension of old age as the consequences of the heightened activity of these organs.

The changes in the respiratory mechanism of old age depends, in the first place, upon the alterations in the thoracic cage, the calcification of the cartilages of the ribs, which if not universally found in old age is exceedingly common, the thinning of the bones, the soldering of the sternal articulations, the drawing up of the posterior costal angle giving a more horizontal direction to the ribs, raising the sternum and enlarging the antero-posterior diameter of the thorax,

the wasting of the intervertebral discs, causing diminished length of the spinal column, narrowing the intercostal spaces and curving the spine. The consequences of all these changes is loss of elasticity and play in the movements of the thorax with diminished haematosis.

Ossification of the rings of the trachea and of the cartilages of the larynx with atrophy of the lining mucous membrane probably play some part in the alterations of the voice so characteristic of the aged. The mucous secretion of the larynx is scanty, thick, colourless, and there is atrophy of the submucous muscular coat.

The teeth suffer from obliteration of their nutritive canals, from senile absorption of the alveolus and from that very common condition pyorrhoea alveolaris; loss of enamel and caries leading to cavity formation, and destruction of the crown of the teeth occur rather in youth and middle age, but no age is exempt. Attacks of periostitis often lead to loss of teeth by loosening them and partially extruding them. When the teeth are gone the mucous membrane covering the jaw becomes pale and hard, so that mastication to a certain extent is possible with toothless jaws; for example, it is recorded of the centenarian Miss Joanna Hastings that she had never used artificial teeth.

The remarkably perfect state of the teeth found in skulls in ancient burials has often been remarked. Dr. Marcel Baudouin, the General Secretary of the French Prehistorical Society, says that there is not a single well-authenticated instance of caries in the teeth of palaeolithic man, and that this disease makes its first appearance in neolithic times, that is to say, with agriculture and polished stone implement,

although with a frequency ten times less than at the present time. It is, however, interesting that one of these palaeolithic dentures shows distinct signs of the use of a toothpick, probably the most ancient evidence we have of the use by man of any toilet implement, yet at the present day we find the toothpick used much more widely by primitive races than by Europeans. Another interesting statement made by Dr. Baudouin is that in the skull of the palaeolithic man of la Chapelle aux Saints, there is distinct evidence of disease which he calls alveolar polyarthritis, or what was formerly called alveolar osteoperiostitis, or expulsive gingivitis (Magitot). In this condition, in consequence of inflammation of the bone the teeth are lost, but the resulting change in the jaw differs from that which takes place in old age by being very uniform in the absorption of the bone, while the edge is rounded instead of being flattened, differences which he believes to be sufficient to prevent the possibility of a mistake to those who are familiar with the disease as described by Magitot. It is further interesting that this disease of the teeth may result from dietetic causes, for example, from scurvy, a disease from which it is not difficult to imagine prehistoric man might easily suffer.

The oesophagus shows slight atrophy of its muscular coat.

The stomach may be dilated or reduced in size according to the amount of food usually taken. The peptic glands undergo atrophy, the mucous membrane becomes thinner, while the sub-mucous connective tissue increases and the muscular coat wastes. The mucous glands become enlarged and are often cystic.

Digestion in old age may be perfect, but in view of the various structural alterations it is frequently

impaired. Unfortunately diminished appetite is exceptional, so that over-loading of the stomach is apt to occur with consequent discomfort and many ill effects. Somnolence after meals is one of the consequences of excess of food.

Defective absorption of food and assimilation, especially of fats with consequent emaciation, is no doubt the chief cause of the loss of weight in old people.

Constipation is so frequent as to be almost constant. It is due to diminution of the digestive juices, of mucus and of muscular power. It leads to colic and haemorrhoids. It is usually of the atonic form, involving the whole length of the colon.

Faecal incontinence from weakness of the sphincter may occur in extreme old age or where from any other cause the muscle has lost its tone.

In old age the bowel often drops into the pelvis, its mucous membrane is pale, its coat thin, the villi wasted and the glands atrophied. In the colon small hernial pouches are often formed in which masses of faeces are retained.

The kidneys are diminished in size and weight; their surfaces irregular, lobulated and presenting cysts. Their capsules are thickened and adherent, the surface of the organ being pale and granular. On section they are tough and the cortical substance is diminished and pale. The medullary portion is sometimes wasted; the renal artery is frequently atheromatous; the tubules and glomeruli are atrophied, and wedges of sclerosed tissue may be seen penetrating the cortex. The mucous membrane lining of the pelvis is dark coloured and thickened. The papillae are blunted at their apices, and it is common to see an excess of fat. The ureters are thickened, their

lining membrane slate coloured, sometimes granular, and there is arteritis of the small vessels.

The bladder may be simply dilated, but its wall often shows muscular and fibrous hypertrophy. When the prostate is enlarged the hypertrophy is columnar; there may be hernial protrusions or pouchings of the wall.

A. T. Salimbeni and L. Gery have made a careful study of the body of a woman aged ninety-three who died of an acute disease after thirty-six hours' illness, the post mortem examination being made about four hours after death. Apart from the lesions of the fatal disease they found many and complex changes; sclerosis, mono-nuclear and macrophagic infiltration, hypoplasia, cellular degeneration and calcification, of which the most widespread and striking was sclerosis, the consequence of the leucocytic infiltration. Hypoplasia showed itself in the glandular organs, whose volume, weight, and histological condition concurred to show that their functions were depressed, but were not abolished. The cellular lesions were least marked and least common. The pituitary body and thyroid showed signs of diminished function, while the suprarenal capsules were hypertrophied. Calcification was very common and involved the vessels, the choroid plexuses, and the spinal marrow. The authors consider that the hypothesis of Metchnikoff as to the effect of intestinal poisons of the aromatic series may explain the widespread vascular lesions, the greater part of the scleroses and infiltration, as well as some of the cell degeneration, but does not explain the involution of certain organs, such as those of the female generative system, which occur at a fixed date independently of the previous condition of the individual or of her mode of life; nor can all the lesions

of cells be explained by it, for while the hypertrophy of the adrenals may be a reaction against intoxication, this cannot account for the diminished function of the thyroid and pituitary body. There is, too, no resemblance between the cell necrosis of the lymphatic glands and the cell degenerations observed in the liver and pancreas.

Ascending infection through their ducts plays an undeniable part in the production of the lesions in the pancreas salivary glands and perhaps also in the liver, and it is reasonable to take into account the effect of various infective diseases during the course of a long life or of various intoxications, small and great, sometimes unperceived, which have on each occasion destroyed a portion of the parenchyma that has been replaced by fibrous tissue. The wearing out of the cells, their senility, and their more or less complete inability to perform their functions have been shown by the acidophile changes in the liver, pancreas, pituitary body, and especially in the lung, where there was neither sclerosis nor any trace of inflammatory action, but simply mechanical wearing out.

The urine in old age is generally diminished in quantity; its density is normal, its acidity slight, the urea diminished, uric acid variable in amount, chlorides normal and phosphoric acid diminished. There is, in fact, a general diminution of solids, the consequence of incomplete assimilation and defective metabolism. The toxicity of the urine of the aged is diminished.

Glycosuria occurs frequently; there is, in fact, a glycosuria of old age due to inability of assimilating carbohydrates. These cases are often mistaken for diabetes. They are usually seen in old people with

a tendency to obesity ; the first stage of the impaired metabolism being obesity and the second glycosuria. When fat formation is no longer possible the excretion of the surplus sugar in the urine is inevitable unless the intake of carbohydrates is diminished. Prout noticed the frequency of sugar in the urine of old people, and Dechambre found it present in 19 out of 20 women aged between sixty and eighty in the Salpêtrière Hospital. The quantity of sugar is generally slight, and there are often no general symptoms, the chief local symptom apt to arise being pruritus.

The senile changes in the genital organs require separate description in the two sexes. In the male the penis is retracted, the scrotum flaccid and wrinkled, the testicles lose their firmness, and are reduced in size, while the epididymis feels hard and nodular, and the scrotal veins are dilated. The dartos muscle wastes, the tunica vaginalis becomes thickened, its two surfaces may be adherent in places, and the serous fluid increased. The vas deferens is usually permeable, but occasionally becomes obliterated ; the spermatic veins are dilated, and their walls atrophied ; the seminal canals show thickening of their walls with consequent narrowing of their lumina ; their intertubular connective tissue is increased, while their nutrient vessels are sclerosed. The spermatozoa are few in number or absent, but they have been found active in very old persons, as in a man aged ninety-four (Demange), and in one of ninety-six (Casper) ; the semen is more gelatinous than normal, and if it contains no spermatozoa is coloured brownish. The retrogression of the testicle begins at about the age of fifty ; at the same time the genital activity diminishes, and the cremasteric reflex weakens or disappears. Loss of desire does not always keep pace

with loss of power, but pleasure is lessened, and the act is often followed by nervous prostration. Sterility is not always a necessary consequence of old age, as is proved by the relatively large number of old men who have been found to possess living spermatozoa, while there are many examples of old men who have procreated children.

In the female the external changes are similar to those in the male, while the vagina becomes relaxed, easily dilatable, or sometimes contracted. The ovaries are shrunken, scarred, and their ovigenous superficial layer disappears shortly after the menopause; there are often cysts on the surface. The tubes lose their ciliated epithelium and are sometimes obliterated. The uterus becomes rounded, diminished in size and weight and denser, while its cavity assumes a cylindrical shape; the cervical canal is often obliterated, generally at the internal opening, when the cavity contains a small quantity, from a few drops to 1 c.c., of coloured fluid. Its lining is covered with viscid yellowish-white mucus, and is thickened, scarred, and marked with haemorrhagic patches; it often shows small cysts or little polypi. The ciliated epithelium disappears, the muscles atrophy, the blood-vessels show endo- and peri-arteritis, while there is a general infiltration of leucocytes, which are the agents by whose means the senile involution is produced (Weinberg and Arval).

At the menopause the chief symptom is the cessation of the menstrual flow, but with this are associated loss of sexual desire, flushings, increase of subcutaneous and abdominal fat, lowering of the pitch of the voice, growth of down or hair on the lips and chin, and predisposition to or loss of resistance to disease. The thyroid gland may be atrophied or

in some cases hypertrophied, with the appearance of some of the symptoms of Graves' disease. The age at which these changes supervene is generally between forty-five and fifty, but they may occur earlier (thirty-five) or later, fifty-five, sixty, sixty-five (Courty); in warm climates, just as puberty is attained earlier so does the menopause take place sooner. Repeated pregnancies are believed by some to retard it. Loss of fertility generally accompanies the cessation of menstruation, but this is not an invariable rule.

In the brain the membranes are thickened, the pia-arachnoid is often adherent to the dura mater; there are calcareous deposits in it, with increase of the pacchionian bodies. The convolutions are wasted, the sulci are widened, and there is correspondingly an increase of the subarachnoid fluid. The pia mater is more or less adherent to the brain substance; on microscopical examination of the convolutions the nerve cells are seen to have undergone pigmentary degeneration, are rounded, and have lost their poles, while the perivascular spaces are widened, loaded with pigment, and the vessels themselves dilated and tortuous. The sections often show vacuoles or spaces, due to the destructive action of the macrophages.

The cerebellum shows minor changes of the same kind.

The neuroglia cells are proliferated; there is an increase of round cells, while miliary haemorrhages, aneurisms, and softenings are often observed.

The spinal cord is rarely atrophied, its consistence is often increased, its membranes may be thickened or calcareous, but any increase of cerebro-spinal fluid is rare. The central canal is frequently obliterated,

and the vessels show periarteritis with thickened sheaths, and there may be miliary softenings.

The functional disturbances of the nervous system seen in old age are: (1) that there is lessening of tactile sensibility, especially in the fingers, while there is increased general sensitiveness to external changes of temperature, particularly to cold; (2) co-ordination becomes defective, while there is some paresis of the lower limbs; (3) the deep reflexes are elicited with greater difficulty than normal. Senile tremor is a constant shaking, unequal in extent but regular in time. It is not very common, as it was observed in only 31 out of 1800 cases (Bougarel).

The metabolism of old age does not appear to differ essentially from that of adult life; there is nothing new or peculiar about it, but merely a gradual slackening of the process. This slowing of metabolism is not wholly due to diminished activity, as even during rest less heat is generated, falling to as low as 28 to 30 calories per kilogram, and upon an amount of food yielding this quantity of calories old people are able to maintain their body weight. There is a great reduction in the amount of urea, instead of the 30 grammes (450 grms.) of adult life they excrete from 5 to 12 grammes (75 to 180 grms.). There is reason to believe that they need only small quantities of protein food, not more than one gramme per kilogram of body weight, but the appetite of old people tends eventually to diminish, and they take less food than is necessary to maintain their weight; this loss of weight does not necessarily involve any impairment of health, and it is even probable that it promotes longevity. We are told that "the small amount of urine, low percentage of urea, solid residue and salts which French authors have called the

characteristics of urine in the aged, are simply explained by the diminished amount of food taken." The excretion of chlorides is normal, and any diminution in sulphur is due to the reduced protein metabolism. There is an increased excretion of phosphates and lime owing to the gradual atrophy of the bones. The evaporation of water from the skin is lessened; the absorption of food in the intestines seems to be about normal. The blood contains a diminished number of cells, to 3,640,000 red corpuscles in old people (Quinquaud); haemoglobin 60 per cent.; the amount of cholesterin is said to be increased, and the proportion of urea high.

Dr. Alonzo E. Taylor says that the protein catabolism is low, not because the endogenous protein catabolism is much lower than in earlier years, but because the aged consume less meat. Less than 0·6 gram per kilo per diem has not been recorded for the protein input of the aged, and this is not less than a normal ration when the depletion of the tissues is taken into account, for the tissues of the aged are richer in fat and poorer in proteid than in earlier life; there is an increased adaptation to low inputs in the diet, probably because the wear and tear needs are low under the conditions of life. In a certain sense metabolism in old age resembles that in chronic subnutrition of mild degree. The retention of proteid is least of all possible in old age and corresponding to the reduced intensity of protoplasmic activity, the sparing power of sugar for protein is very pronounced in old age.

In the aged the axillary temperature is, as a rule, subnormal; it may be 36° C. (96·8 F.), but the rectal temperature is normal or increased. Thus Charcot found the rectal temperature of a woman aged a

hundred and three to be 38° (100·2 F.). The apparent hypothemia is therefore the consequence of the deficient circulation in the skin. There is, however, a decrease in the gaseous exchange, and the production of heat, although this is probably not more than would be found in adult years under similar conditions of inactivity. When weight and height were nearly the same the amount of oxygen consumed by old men of seventy to eighty-six years of age, while in the resting state, was only 73 per cent. to 86 per cent. (on an average 80 per cent.), while the amount of carbon dioxide excreted was only 82 per cent. of the quantities found in the case of robust individuals of middle age. The metabolism may be so lowered that its total for twenty-four hours spent in the respiration chamber does not reach the minimal daily metabolism of more youthful men when in an absolute resting condition. There is a general diminution of all the processes of oxidation in old age, but the heat loss adapts itself to the altered conditions by reducing heat conduction and radiation and by limiting the evaporation of water from the dryer skin (A. Magnus Levy).

CHAPTER III

The Diseases of Old Age

Diseases of the Skin, Bones, Ears, Eyes, and Brain—Dementia—Cerebral Haemorrhage—Senile Chorea—Paralysis Agitans — Intermittent Claudication — Pseudo-bulbar Paralysis — Senile Epilepsy — Neurasthenia — Cramp — Nocturnal Hemiplegia.

The Skin

In addition to the changes which have already been mentioned in describing the external appearances of old age, such as the dryness of the skin, its tendency to crack, its loss of or altered distribution of pigment, the surface, owing to atrophy of the subcutaneous fat and of the elastic fibres, becomes wrinkled, especially where it is loose, for example, round the eyes and the mouth; in other places it becomes smooth from wasting of the papillae. Fatty granules may be deposited in certain spots, in others pigment-forming moles. There are star-shaped dilatations of veins, and small haemorrhages often take place, especially in the lower extremities. Owing to the loss of the adipose layer the eyeballs sink, while the bony prominences project. There is a tendency for the growth of warts which may degenerate and become epitheliomatus. Rodent ulcer occurs on the face, on the side of the nose, or on the cheek below the orbit. Corns on the feet become more numerous. The scalp is often affected with seborrhoea, in which condition

there is a considerable shedding of minute scales with which the coats of old men are often liberally powdered.

Old people, like children, seem to have lost the immunity to parasites which is characteristic of vigorous man and womanhood. The various forms of pediculi easily attack them unless scrupulous cleanliness is maintained. A common skin parasite is the microsporon furfur, which often spreads widely over the body and may be mistaken for pigmentation.

Boils, which we now know to be due to a streptococcal infection of the skin, seem prone to occur in old age as in childhood.

Carbuncles may form, causing great suffering and sometimes proving fatal.

Old people are particularly liable to various kinds of dermatitis or eczema. **Intertrigo** affects those who are stout, while dry scaly **eczema** on the outer and posterior aspects of the limbs is common in the slender. The skin is especially vulnerable in old age, and many of their skin affections are due to the exaggerated effect of some usually innocuous agent; for example, the dye in socks, a particular kind of soap, or the mechanical friction of underclothing. It would undoubtedly be better if old people could have regular superficial massage, with the use of some oil or unguent.

Erythematous eruptions, including **urticarias**, undoubtedly depend upon some poison, usually of food or drug origin, and it is interesting to note that after the injection of diphtheria antitoxin such urticarial rashes have been often observed; these are thought to be anaphylactic in their nature, that is to say, due to the liberation or formation of some substances (antibodies) in the blood, perhaps previously held in combination but set free by the action of the antitoxin.

Pruritus or **Prurigo** and various non-parasitic itching affections of the skin are very common in old age, and are often caused by poverty, debility, or gout, deficient secretion of urine, uterine disease, piles, or worms. P. senilis is a form associated with various chronic constitutional conditions, such as chronic Bright's disease and diabetes. It is worse in spring and summer. When it becomes established it is incurable.

The various papular eruptions **Lichen simplex** and **L. planus** are not uncommon.

There is a senile form of **Purpura** affecting the lower limbs, often associated with latent Bright's disease.

Herpes zoster or **zona** occurs with peculiar intensity in old age, and often gives rise to considerable pain before and after the eruption, in some cases causing troublesome ulceration that heals slowly and leaves scars.

Perforating ulcer affecting the sole of the foot, especially the ball of the great toe, or the plantar aspect of any one of the toes, is usually associated with the existence of tabes or some grave lesion of the brain and spinal cord, or with diabetes. It generally starts in a corn on the sole of the foot ; a small, round, punched-out ulcer penetrates the skin, and at the bottom exposed bone can often be felt. It is characteristic of a perforating ulcer that it is insensitive and can be explored with a probe without causing pain or even the least discomfort.

Raynaud's disease, although usually seen in young adults, is occasionally met with in the old, but usually in the course of some chronic affection such as gout or diabetes. It may affect the tips of the

fingers or toes, the margins of the pinnae, the tip of the nose or even the tip of the tongue. The part affected is pale or livid, it tingles or feels numb or may be the seat of severe pain, while at the same time the sensation to touch is more or less blunted. The affection may be unilateral or bilateral, and is sometimes exactly symmetrical. It may come on in paroxysms occurring many times a day, or at longer intervals, or only in cold weather. In its mildest form it produces only the so-called "dead finger," which is often seen after washing the hands in the morning or while playing the piano or sewing. In the more marked form there is sudden discoloration of the skin varying in tint from a dusky blue to an intense purplish-black. In the most extreme degree there is gangrene, usually confined to a small portion of the affected area; a blister forms which bursts, causing an ulcer which on healing leaves a scar behind. The amount of destruction varies and may extend to any depth, but, as a rule, the bone escapes. There is usually pain during the cyanosed stage, but in some cases this is absent.

Erythromelalgia occasionally occurs in old people, although it is usually an affection of middle life. It is characterised by burning or stabbing pain generally in one foot, coming on suddenly or gradually and often of the utmost severity. The pain intermits, the intervals lasting from a few minutes to several hours; it is relieved by a horizontal position, by rest, and by cold applications. The skin of the affected area later on becomes red and swollen, while the redness gives place to a bluish dusky tint which persists for some little time. The pain is more intense during the red phase. The local temperature is usually higher than in the unaffected foot, but

when cyanosis supervenes the temperature falls. Other parts of the body may be affected.

Senile gangrene is dependent upon the chronic arterio-sclerotic changes which will be described more fully in discussing the changes in the vascular system. It usually affects the toes of one lower extremity, but may gradually extend so as to involve the whole of the foot and part of the leg. It originates frequently in slight injuries, such as a prick from a nail in the sole of a boot, or in cutting a corn ; this injury allows of the entrance of microbes into the veins, by which means thrombosis occurs and spreads.

Disturbances of pigmentation occur so frequently in old age as to be almost normal. Large patches of yellowish-brown pigment occur on the hands and face ; these are often associated with **leucoderma** or loss of pigment in neighbouring areas of the skin.

Pemphigus is a disease which, while relatively common under the age of five years, disappears from the causes of death until after twenty, is rarely met with until fifty-five, but from that age onwards reappears and occurs with rather greater frequency among women than men. It is a distressing condition for which arsenic is not so uniformly successful a remedy as Sir J. Hutchinson taught.

Acne, especially acne rosacea, may be extremely severe in old age, and when localised on the nose and adjacent parts of the face may cause a condition called **Rhinophyma**, a bulky hypertrophy of the sebaceous glands combined with fibromatous growth. It is often caused by living in ill-ventilated rooms, and may be cured by fresh air. Cases of longer standing can be cured by Finsen's light treatment.

Sebaceous cysts, which are retention cysts due

to blocking of the duct and accumulation of the secretion of the gland, occur especially on the scalp or the back.

Xanthelasma or **Xanthoma** is most usually seen on the eyelids, but may also occur on the extensor surfaces of the limbs, particularly on the elbows, the trunk and the buttocks.

Occasionally the mucous membrane of the mouth is affected. It is characterised by growths of yellowish colour in the skin, which occur either as flat plates (*X. planum*) or as nodules (*X. tuberosum*). It is rarely seen before forty years of age, and as its disfiguring patches continue to grow it may become more noticeable in course of time. The patches which so often appear on the eyelids vary in size from a pin's head to a pea or larger, and in colour through every shade of yellow. There is sometimes a sensation of itching or burning in them. Xanthoma is often associated with diabetes, and should always suggest an examination of the urine.

Fibromatous nodules may grow in the skin and become numerous, while **Angiomatous tumours** or **Naevi** which have remained small and quiescent for a lifetime may grow rapidly and degenerate into malignant tumours.

Thus it will be seen that the skin in old age is very vulnerable and is liable to a great number of affections, most of which can be prevented. The majority are due to diathetic conditions dependent upon constitutional changes, that would not have developed had a more regular mode of life been pursued.

Rodent ulcer is particularly liable to attack the skin of the face or the side of the nose in elderly

persons. A small oval slightly reddened itching patch develops; it is scarcely raised, but presents a characteristic appearance. If recognised and promptly excised or destroyed thoroughly with potassa fusa or solid carbonic acid it may be cured, but if neglected the skin breaks down and slowly a spreading ulcer forms, which, in spite of radium and other new methods of treatment, pursues its disfiguring course, and though seldom itself a cause of death is a source of so much misery that death comes as a release from suffering. Excision whenever this is possible is the right treatment; where it has gone too far it may be handed over to the radium specialist, who rarely effects a cure, the ulcer spreading in one direction while it is being healed by radium in another.

A new method of healing rodent ulcer has been recently proposed and carried out successfully by Dr. L. C. Peel Ritchie. He applies to the surface a solution of adrenalin (1 : 10,000) soaked in lint, changing it daily. In the case he relates the patient, aged sixty-eight, was treated six years ago; the ulcer healed in about ten weeks, and when seen recently the scar was quite sound.

The Bones

The senile changes in bone have been described in the chapter on normal old age.

Senile osteomalacia is rare, but when it occurs it progresses steadily without showing the remissions that are seen earlier in life. It affects the spine, thorax and pelvis, and is due to gradual decalcification of the skeleton

Multiple myeloma is more a disease of later

middle life than of old age, yet should not be forgotten; when a man begins to complain of his breast-bone sticking out and has albumen in his urine, it is a mistake to ignore the bone condition and treat the case as one of Bright's disease! The albumen is that first described by and often called after Bence Jones, but renamed hemi-albumose by Salkowski; it is precipitated by nitric acid, dissolved on heating, but comes down again on cooling.

Primary growths in bone are rare at this period of life, but cancerous metastatic deposits may occur secondarily to primary growths in other parts.

The "**quiet necrosis**" of Paget, now recognised to be a mild staphylococcus infection, may be met with between fifty and sixty.

Tubercle of bone occurs in old persons as in other tissues; tuberculous dactylitis must not be mistaken for gout or rheumatism, is painless, but slowly progressive, yielding only to excision or amputation.

Syphilitic bone lesions are occasionally encountered, but are usually of old standing. If obstinate they are best treated by a course at Aix la Chapelle.

The Ear

Depoutre, who examined the **temporal bone** of 54 persons over sixty, found serious lesions in 28, slight lesions in 14, and normal conditions in 12. After eighty the ear was never normal, and the changes advanced in proportion to the age. The external auditory canal contained a block of wax in 26 per cent.; its bony wall was frequently hypertrophied, with consequent narrowing of the passage, and the lining was frequently in an eczematous condition. The

drum often showed opacities, sometimes calcareous deposits or atrophic and translucent patches. The antrum was sometimes enlarged and its roof thickened and eburnated. The mastoid process was often eburnated, and in a third of the cases it was pneumatic, that is, it was cavitated by more or less dilated alveoli or cells. The more serious lesions were ankylosis of the hammer and anvil, ankylosis of the stirrup with the fenestrum ovale, adhesion of the bones to the drum, and atrophy of the bones.

The changes in the internal ear are little known, but nerve deafness appears to be rare. According to Loewenberg quoted by Metchnikoff, the normal senile defect seems to be complete insensibility to high notes and slightly impaired hearing for low notes.

The Eye

The functional changes in the eyes have been carefully studied. The motility, field of vision and tension are normal, acuity of vision is diminished, as are also the reflexes to light and accommodation. The refractive changes are presbyopia, due to changes in the lens and weakening of the ciliary muscle, but, however strong the muscle might be, it could not affect the rigid lens, and the atrophy of the muscle is consecutive to its loss of function. Colour vision is impaired. There is confusion of blue and green, white and pale yellow, pale green and yellow, red and green, giving rise to what has been called the senile manner of painters (Angellucci).

The changes in the external appearances of the eyes as age advances are marked. In the first place, there is the fatty degeneration of the cornea, which

produces the well-known *arcus senilis*. The conjunctivae often assume a subicteric tinge and the sclerotic loses its pearly whiteness and becomes yellowish. The iris becomes sclerosed and slightly atrophied, and the pupils are narrow and may become unsymmetrical in shape and deformed. The presbyopic changes in the eye, which come on at about forty-five, mainly consist in the gradual hardening and flattening of the lens, which loses its original crystal clearness and becomes slightly opaque, yellow, and finally cataractous. The vitreous frequently contains floating bodies; the fundus shows a well-defined papilla, the vessels are slender and the peripapillary area is pale, due to localised choroidal atrophy. From weakening of the orbicularis muscle ectropion occurs with epiphora, the tears tending to run over the cheek.

Entropion is due to spasm of the palpebral portion of the obicularis muscle with relaxation of the skin of the eyelid. Chronic blepharitis is common in consequence of the eversion of the eyelid, and the exposure of the palpebral conjunctiva to mechanical causes of irritation.

The Brain

While the **intelligence** of the aged is often conserved the senses suffer, and defective vision and hearing may make old people seem less intelligent than they are. The mechanism of the memory becomes impaired, while new ideas are accepted with difficulty and often with dislike; intellectual effort, if long continued, becomes painful, and the power of sustained attention becomes weakened. Most remarkable is the blunting of the sensitiveness to

emotion; old people suffer the loss of near relatives with comparatively little disturbance, while external affairs cease to have any strong interest for them. It becomes increasingly difficult for them to make up their minds to any new course of conduct, such as to leave a house they have lived in for long, to change any habit, to deprive themselves of any accustomed comfort, or to reduce expenditure. Thus, a widow lady, whose income was solely derived from leasehold property, could not be persuaded to reduce her expenditure when it was seen that she was likely to outlive her income, and persisted in maintaining exactly her former mode of life until the leases fell out, her income ceased, and she was reduced from comfort to absolute poverty.

Senile Dementia.—Scheffler describes three stages: (1) The mental faculties are intact, but there exists an impossibility to acquire new matter; the will is weakened, while there is exaggeration of the instincts of conservation of property and of reproduction. (2) Gradual disappearance of intellectual powers and affectionate feeling, with a progressive return to instinctive manifestations uncontrolled by reason or judgment. (3) Dementia with complete disappearance of intellectual faculties, of conscience and free-will. Responsibility, which is intact in the first stage, is partial or limited in the second and does not exist in the third.

The crimes of old age depend upon these changes, and one has not to wait very long to read in the newspapers the case of an old man whose life has been hitherto blameless, convicted of some offence against decency, which depends upon his being in the second stage of senile dementia. In this stage they often show to casual observers no intellectual deficiency,

but an apparent inability to appreciate the nature of their offence. When the dementia is complete the character may be completely altered, patients become morose, vindictive, or jealous; they are usually careless of their dress and person, often disposed to intemperance in food and drink, and they frequently indulge in bad language.

In common with other organs of the body, the brain suffers from the effects of toxins, from poison such as alcohol, and from gout, Bright's disease, syphilis, and influenza. It is also liable to be affected by excessive mental strain, by worry, insufficient food, and by mechanical injury.

The development of **insanity** is attributable to (1) vascular disease; (2) hereditary predisposition; (3) toxic processes. There is not much ground for the belief that old age is a potent cause of insanity, but where there is hereditary predisposition, and the brain has withstood the shocks and strains of active youth and adult life, it sometimes breaks down under the debilitating influences of senile decay. Peculiarities of temperament, which were held in check by the pressure of environment during the active period of life, become accentuated when through age the man or the woman is more or less isolated. Tendencies to suspicion, avarice, diffidence, or egotism are then unrestrained, and may be manifested in such a degree as to impair the character and judgment, and to poison social and family relations.

Vascular lesions such as atheroma, arteriosclerosis, thrombosis, embolism, and haemorrhage are frequent, and secondary softenings resulting from these may be associated with changes of character. Thus the cheerful, sanguine man is seen to grow irritable or morose, emotional, and restless; there

may be aphasia or localised paralysis, while trophic lesions such as bed sores are prone to develop. He may become degraded in his habits, careless in his mode of eating, untidy in his dress, indifferent to decency, while hallucinations of vision or hearing may be present.

The early **symptoms** of brain disease are giddiness, vomiting, subjective noises or flashes of light, transitory paralysis, especially of the cranial nerves, weakened control over the bladder and rectum, perversions of sensations such as itching, tingling, or burning of the skin, loss of or diminished sensation in particular parts, epileptiform seizures or temporary loss of consciousness, slight fever, impaired appetite, refusal of food, confusion of ideas, attacks of stupor lasting from twenty-four to forty-eight hours, loss of sleep, reticence, and hallucinations of sight and hearing.

Either melancholia or mania may be added to the picture of senile dementia; in the former there is mental depression often associated with delusions of persecution and of religious terrors; the patient imagines that he has committed "the unpardonable sin," and under the influence of such distressing ideas he may commit suicide. In mania there is excitement, restlessness, shouting, and sleeplessness, followed by exhaustion which may be fatal or may pass into melancholia.

The **prognosis** is generally unfavourable, but not so hopeless as might be expected at an age when it would seem unreasonable to look for any power of recuperation. Thus an aged clergyman with hereditary predisposition to insanity became melancholic, restless, sleepless, and suffered from delusions of financial ruin as the result of some worry determined by the loss of a considerable sum of money,

but yet one which he could quite well afford. He recovered in about a year and lived for several years without any relapse, resuming his clerical duties and performing them daily until a very short time before he died.

Wherever possible it is desirable that old persons should not be removed from their familiar surroundings, but be treated in their own homes. However much we may wish to do this, removal may be necessary when they are noisy or violent or show sexual perversion; in these circumstances treatment in an asylum is the only efficient method of dealing with the case. With the aged, women nurses are much to be preferred to men, as they are kinder and gentler, so that even where the help of a male nurse may be needed at times it is better to allow the chief share of the work to be done by women. The clothing should be made of light woollen material, and if there is any trouble from the patient trying to undress himself, the clothes may be made to fasten down the back.

There is a form of **Dementia Paralytica** or **general paralysis** which supervenes in old age, and is usually fatal in eighteen months from its commencement. It is characterised by the usual megalomania, by congestive attacks causing transient hemiplegia, by more or less rapid failure of strength, the patient ultimately becoming confined to his bed; bed sores too often develop, and death results from hypostatic pneumonia.

The **delirium of collapse** is liable to occur in old people from shock or after acute diseases or from auto-toxins. In this condition the temperature is subnormal, the pulse small and feeble, the tongue foul, and the bowels constipated, but there may be incontinence of urine and faeces. The abdomen is

usually retracted while the flanks are distended by the ballooned colon. Death may occur rapidly; in other cases the patient remains sleepless, excited, agitated, refusing his food and suffering from vivid hallucinations of sight and hearing.

Cerebral Haemorrhage.—The termination of life by cerebral haemorrhage is exceedingly common in old persons. The average of the ten years 1901–10 gives the proportion per million as 668 for males, and 765 for females. It is surprising to find that there is still preponderance in females, as they are generally supposed to suffer less from arterio-sclerosis. The mortality per million at ages over thirty-five is 2096 for males and 2306 for females, and the number of deaths between fifty-five and sixty-five is double that between forty-five and fifty-five, and again three times as many in the decade between sixty-five and seventy-five.

Moreover, the death rate discloses only a portion of the cases in which cerebral haemorrhage occurs, as many cases are omitted in which it is not the actual cause of death. It properly includes cases of embolism and thrombosis, as in old age these are all dependent upon allied conditions of vascular disease.

A young person who gets a hemiplegia from embolism or syphilitic thrombosis may suffer from more or less permanent paralysis, but the mental condition is, as a rule, not impaired; speech may be regained, the paralysis may pass away, or if the power of the right hand is lost the left may be educated to write and do other things, so that the patient is not reduced to impotence. I constantly see a man whom I attended thirty years ago with complete right-sided paralysis and aphasia, no doubt of syphilitic origin; his power of speech and of walking are

restored perfectly, and the only permanent change is in his handwriting, which formerly was bold and clear, but since his illness has been small and cramped. Such perfect recovery must not be expected in elderly persons; above all, the mental functions are never unaffected, the character is often altered, the capacity for work, for concentration of ideas, and for judgment in matters of business has generally diminished, and although life may be prolonged for years the man is not as he once was, retirement from active duties is desirable if not imperative, and continuance in business may often have disastrous results.

The **symptoms** of cerebral haemorrhage or thrombosis or embolism vary with the seat and extent of the lesion; in a slight case there may be only temporary impairment of speech and weakness of the right arm with permanent loss of taxis in the fingers. I remember such a case in a man who held an important position in a large bank; on account of the slight character of the attack and the speedy disappearance of symptoms he did not retire for several years, but I was told by his colleagues that he was practically useless, and was regarded as a supernumerary at his business, yet no one would have suspected this in his ordinary social relations, and he happily preserved his genial temper, which no doubt had much to do with his remaining in his post. Under ordinary circumstances his retention might have been impossible, but there had been one or two amalgamations, and there were really more men at the top than were wanted for the work there was to be done, but under the conditions of the amalgamation they had to be given posts of dignity and emolument. He ultimately retired and died soon afterwards of a second and larger haemorrhage.

There are many sad cases in which life is prolonged in spite of permanent paralysis, impaired speech and general impotence, when continued existence is a burden to the patient and a painful trial to devoted relatives. A fatal haemorrhage is not at all a bad way of making one's exit from this world, but we may all hope to be preserved from a serious haemorrhage that is not fatal.

Diagnosis.—A cerebral haemorrhage or thrombosis or embolism is generally readily diagnosed, but occasionally a uraemic attack may cause paralysis, hemiplegia or monoplegia and lead to a mistake, but the uraemic paralysis follows an epileptiform convulsion and soon passes off unless the patient dies in coma. This is the condition in which bleeding earned its reputation as a remedy for apoplexy. Inequality of the pupils is a useful diagnostic point in favour of organic brain lesion.

The immediate *treatment* is rest, quiet, a purgative dose of calomel, an ice-cap, and no food. If recovery begins the food must be small in amount, simple, and non-stimulating in character, avoiding alcohol, soups, beef teas, and all hot drinks; the paralysed limb may be wrapped in flannel or in cotton-wool. No energetic treatment such as electricity and massage should be allowed until the general condition has recovered from the shock, which is usually three or four weeks; nothing is lost by delay. There is always more paralysis at first than will be permanent, as the neighbouring parts suffer from pressure which is relieved as the clot shrinks and is absorbed, but this improvement is the result of natural processes, and is not due to treatment. It is usual to give a mixture containing small doses of iodide of potassium with or without bromide, but its curative effect is

doubtful; however, it is better to prescribe it. At the end of six months such recovery as is possible has taken place, and further treatment can only be used to pacify the patient. Old hemiplegics go to Zander Institutes and amuse themselves by passive exercises, which have a good mental effect and should not be discouraged if the patient's circumstances and general condition do not forbid them.

The diet should continue to be light and non-stimulating, with no alcohol, while the use of tobacco and tea should be restricted. So far as possible the patient's life should be free from worry and business care, excitement should be avoided, exertion should be forbidden, but such moderate exercise as is possible should be encouraged.

A carriage or a bath chair is generally the only means by which the patient can get any distance; changes of temperature are readily felt, and such patients require warm but light clothing, with a hot-water bottle to the feet.

During the acute stage the temperature should be taken in the rectum, as a rise points to a fatal termination, although not with absolute certainty unless it continues and reaches 105° or 106°, when death is imminent.

Vomiting often precedes a recurrence of the haemorrhage.

Softening of the brain not unfrequently follows a cerebral haemorrhage or thrombosis, and is manifested by irritability and mental enfeeblement passing into imbecility, emotionalism, paresis of the facial muscles, increasing weakness, impaired control over the sphincters, and progressive decadence until the patient becomes helpless and probably dies of hypostatic pneumonia.

There is a form of chronic progressive softening which occurs as a primary condition, and is not directly connected with disease of the blood-vessels. It is slow in development, but advances in a progressive manner, so as eventually to involve a large part of the brain substance. The symptoms are very much those which have been already described, but there may be premonitory symptoms, such as headache, giddiness, failure of mental power, tingling, numbness or weakness in one limb, and occasionally cramp. The duration of the disease varies much from a few months to years, and death is often the result of some intercurrent disease. In certain cases the presence of optic neuritis, headache, and vomiting may suggest the presence of a tumour.

Senile Chorea or **Chorea in the Aged** is a rare affection; in the Registrar-General's report for 1910 there are four males and six females recorded as having died of this disease between the ages of sixty-five and eighty-five in England and Wales. The first mention of it appears in Graves' Clinical Lectures. He had seen only one case, an apothecary of Dublin aged seventy, about which he gives no details except that "it was very severe, and lasted many months." So the subject remained unnoticed until the publication of Charcot's lecture on Chorea in Old People. The publication of this lecture was followed by accounts of several cases, notably by the late Dr. James Russell of Birmingham, two cases; Mr. C. J. Devis, one case; Dr. Wharton Sinkler, two cases, and Dr. Bacon, one case. In 1884 I published a short paper in the *Lancet*, giving notes of three cases, one of which had been previously recorded by Dr. Russell.

The first was a man of intemperate habits, aged sixty-six years, who was suffering from advanced

disease of the aortic valves; the chorea affected the left side and chiefly the upper extremity; the movements were not without intermission, and were to some extent under voluntary control. They consisted of rapid flexion and rotation of the left arm, which was slipped behind his back; the movement was so constant as to have worn a smooth patch on his coat over the left scapular region where his hand passed. There was not the slightest appearance of dementia, although there was marked impairment of general health. He had never had acute rheumatism, and did not attribute his illness to any emotional cause, but he had had worry in his business. After some months the movements diminished, but "there still remained some nervous hasty involuntary movements, especially of the hand and wrist." There was no albuminuria. The second case was that of a man aged sixty-eight, who had been ill for eighteen months; there was no cardiac disease or history of rheumatism, but his urine contained a trace of albumen with granular and blood casts, with blood corpuscles and renal epithelium. He presented no signs of dementia. He was unable to assign any cause for his illness. The movements in this case were chiefly in the right hand, a continuous "pill-making" rotation of the fingers and thumb, but every few minutes this was interrupted by a spasmodic sweep of the arm and hand to the face as if to stroke his chin.

The third case was an old man of eighty-seven, who came to the hospital complaining of bronchitis; there was no valvular disease of the heart, but his urine contained a trace of albumen, and there was probably some dilatation with arterial degeneration. The movements were not constant, and chiefly affected the arms, although the legs were not free. The

muscles which appeared to act most violently were those connecting the trunk with the upper extremity, especially the scapular muscles, which jerked his arms until his back ached. The movements were so violent as to throw him about in his chair, or, if he were standing, to make it difficult for him to remain erect, and to awaken him from his sleep. At the time he was seen the disease had lasted about five weeks. He had never had a fit or been paralysed, and said he had always been temperate. He showed no signs of dementia, and denied having had any trouble; his disposition seemed cheerful. The twitching began first in the right shoulder. He was able to pick up a pin fairly well, and said he had no difficulty in buttoning his clothes.

These cases are opposed to Charcot's opinion that the disease is always associated with dementia, nor do they give any support to the emotional theory of its origin. In all there was evidence of senile arterial degeneration, with probable renal disease. One of the cases described by Dr. James Russell was that of a lady aged seventy-seven who recovered after an illness of about three months, and in my first case there was sufficient improvement to make it possible to say that the condition is not altogether hopeless, but the mortality is high. We know little about its pathology, but it is certainly probable that it depends upon minute haemorrhages in the corpus striatum. It is true that Poynton and Payne have isolated the *Diplococcus rheumaticus* from the cerebro-spinal fluid of cases of fatal chorea, but the specific nature of that organism has not been proved to my satisfaction.

This condition must not be confounded with **senile tremor** to which the term chorea is sometimes

improperly applied. In senile tremor the movements are oscillatory, and not combined or gesticulating. Moreover, as a rule they are confined to the head.

Paralysis agitans or **Parkinson's Disease** is emphatically a disease of old age, often showing its earliest indications when the patient is nearer seventy than sixty, attacking too those who have had uninterrupted good health and without any assignable cause, although emotional disturbance undoubtedly intensifies it, if it does not initiate it. The pathology of the disease is still so obscure that it is not possible to assign to it a rational etiology, but if it is a functional disease of the brain, or, as Hughlings Jackson thought, of the cerebellum it is conceivable that shock may start the process in some cases. Its relation to the menopause in women may be granted without the admission throwing any great light upon the question. It does not appear to have any connection with senile cardio-vascular changes.

The disease begins, as a rule, with rhythmical tremor of one hand, the movements being persistent but under control, so that by an effort of will it is for long possible for the patient to fasten his clothes, to feed himself, and even to perform more delicate work such as writing and needlework. The progress of the disease is slow, but the shaking gradually spreads to involve all the limbs, and sometimes the head, while the execution of combined movements of any minuteness becomes impossible. These stages may last over several years, but the advance of the symptoms is precipitated by any physical or emotional shock. Sooner or later the disease develops, the tremor continues, but to this is added a bending forward of the spine from the loins, so that the body assumes a stooping position, while the head is

sometimes carried erect ; in other cases it is bent ; the muscles of the face become stiff, the features losing their expression and maintaining under all circumstances a staring immobility ; the gait is altered to a run, which has been well described as looking as if the patient were pursuing his centre of gravity, but it is more stable than it looks, and patients, even in this stage, can sometimes walk a good many miles. In spite of their rather ridiculous appearance there is no loss of mental power, nor are they prone to anger, but they are often lachrymose, shedding tears easily. As their condition is really pitiable it is not surprising if they feel sorry for themselves, and evoke expressions of sympathy from others that may perhaps conduce to such loss of control over their feelings.

Lastly, comes the stage of muscular failure, when it is no longer possible for the patient to get about, and he becomes confined to bed, more or less a helpless invalid, until life is terminated by pneumonia. The presence of Parkinson's disease does not exclude the possibility of the development of any other senile affection such as those of the urinary organs, digestive system, kidneys, or heart, with their customary consequences and the necessary modification of the picture.

The average duration of the disease is fifteen or twenty years.

Recent observations have shown that the protein metabolism is not increased, that the effect of thyroid extract is the same as in a healthy individual, and that the intermediate metabolism of albumen is also unaffected (Von Noorden's " Metabolism," Trans., Walker Hall, vol. iii., p. 1248). The course of the disease, although slow, is steady, and is not prevented by any means known at present ; fresh air, simple

diet, and abundant sleep are essential. Hyoscin, or scopolamin, in doses of gr. $\frac{1}{200}$, may be tried twice or thrice daily. Cod-liver oil does as much good as anything, combined with the application of the general rules for the care of old people which are given elsewhere in this work.

Charcot found that some of his patients thought themselves better after driving to the Salpêtrière over the rough " pavé " of that quarter of the city, so he established what he called a " fauteuil roulant," an armchair worked by a crank, which jolted the occupant when the handle was turned in such a fashion as to imitate the motion of the cab, but the results when I was at the Salpêtrière were not encouraging, and I expect its use has been given up long ago. Massage and passive movements may be tried, and where there is access to a Zander Institute vibratory massage should have an extended trial.

Intermittent claudication or intermittent lameness in the horse was first attributed by Bouley to partial or complete obliteration of the arteries supplying the muscles concerned, but in 1858 Charcot applied the term to a similar condition in the human subject dependent upon arterio-sclerotic changes, and often the precursor of senile gangrene. The principal symptoms are weakness, numbness, or pain in the lower extremities with coldness, pallor, or cyanosis of the feet, and disappearance or extreme weakness of the pulse in the anterior and posterior tibial vessels, or even in the popliteal, femoral, or iliac arteries; spasm of the arteries plays an important part in its production. These conditions are usually bilateral. The disease is more common in males than in females, and is said to occur more frequently among the well-to-do. It is attributed to cold, and to the abuse of tobacco.

Pseudo-bulbar paralysis is a disease of old age, as it is dependent on arterio-sclerotic changes in the brain. The lesions are generally in the internal capsule and bilateral, but may be unilateral or in the pons. The symptoms are interference with articulation and swallowing, spreading to the muscles of the upper extremities. It is with difficulty differentiated from true bulbar paralysis, but the latter runs a more chronic course, and is more definitely localised in the muscles of the mouth, pharynx and larynx, the wasting of the lips and tongue being very marked.

Senile epilepsy probably in all cases originates in arterio-sclerosis ; the vascular change leads to thrombosis and softening, and the patch of softening is the focus from which the discharge starts. The condition is not very uncommon. Besides arterio-sclerosis, falls, blows on the head, and the abuse of alcohol play an important part in the production of these cases.

The fit does not differ in its features from that which occurs earlier in life, assuming the " grand mal " type. It is usually associated with dementia, or we may put it that after one or two fits the failure of mental power becomes very noticeable. There is also, as a rule, great physical weakness, the circulation is feeble, and life is not usually prolonged.

Senile Neurasthenia is not very common, its symptoms resemble those of ordinary neurasthenia, but are distinguished by their sudden onset without any occasioning cause or warning. The chief symptoms are headache, sleeplessness, vertigo, mental depression, exhaustion, and flushing of the face. It depends upon arterio-sclerotic changes, and is not associated with any history, family or personal, of nervous disorders. A very characteristic feature is

the effect of alcohol, which, in even the smallest quantity, aggravates all the symptoms.

Old people often suffer from **cramp in the calves** of the legs, which comes on when they are in bed. It is all the more distressing as it obliges them to get out of a warm bed in order to disperse it by walking about the room. It is dependent upon impaired blood supply to the muscles concerned, but its onset is determined by pressure, yet there are other factors in its causation which predispose to it. One is gout; Ebstein pointed out long ago that cramp in the calves of the legs often precedes an attack of acute gout; but certain articles of diet are effective agents. An old man told me that he used to suffer from cramp, and was in the habit of drinking coffee in the evening, but his coffee machine got out of order, and while it was away he did without coffee; on its return he resumed the habit and had fresh attacks of cramp which he then noticed had been absent while he took no coffee; he then left off coffee and had no further trouble with the cramp. It is not pretended that coffee explains all cases, but many are due to dietetic poisons, and in each instance there should be careful revision of the diet, especially of that which is taken late in the day. A recent writer advocates the administration of ten or fifteen grains of antipyrin one hour before going to bed (*Brit. Med. Jour.* 1912, vol. ii., p. 1428). The medicinal use of strychnine or nux vomica may induce the attacks in susceptible persons, and all those who have a feeble circulation, or suffer from chronic Bright's disease, diabetes, or gout come into this category; chronic constipation is also a predisposing factor.

The condition which Weir Mitchell called **nocturnal hemiplegia** is fairly common in elderly people, and is

not only distressing in itself, but a cause of alarm, as it is regarded as threatening a more permanent form of paralysis. The patient wakes in the night to find that one arm or an arm and a leg on the same side, or less commonly both legs are numb and cannot be moved. By rubbing the affected limb with the other hand the condition passes off in a few minutes, but not until it has produced great anxiety, at least, during the first experience of such an attack. As a rule, the affected limb or limbs are those on the side on which the patient has been lying, so that it is a mild form of pressure paralysis, but it is also dependent upon digestive derangement or anæmia. In many cases collected by me some years ago I found that the attacks ceased under regulated diet, including abstinence from tea and coffee, at least, in the latter part of the day, with one or two doses of blue pill, and the use for a few days of a digestive powder of rhubarb, soda, bismuth, and compound cinnamon powder taken before each meal. (See Appendix of Prescriptions, No. 4.)

CHAPTER IV

Diseases of the Heart and Blood Vessels

Heart Disease — Stokes-Adams syndrome — Cheyne Stokes breathing—Valvular disease—Myocarditis—Angina pertoris—Arterial disease.

The chief causes of death in persons over fifty-five years of age are **diseases of the heart and blood vessels,** to which more than a quarter of all the deaths are attributed; this applies equally to both sexes.

Heart Disease.—Huchard has described four types of heart disease in old age: (*a*) the painful; (*b*) the irregular; (*c*) tachycardial; (*d*) myovalvular. In the first of these the patient suffers from anginal attacks of more or less severity which may be dependent upon or aggravated by the use of such poisons as alcohol, tobacco, tea, and coffee. In the second, the irregularity may be, as already stated, of little importance and hardly noticed by the patient, but in other cases it may be associated with disagreeable sensations, such as, for example, when intermission occurs the patient feels a sort of mild explosion in his head, or there is a feeling of a rumbling movement in the heart. The so-called Stokes-Adams syndrome should be included in the "irregular" type. In it the pulse stops often for several seconds, the face becomes pale, the eyes close, and there is loss of consciousness, sometimes accompanied by a convulsion,

At the end of a longer or shorter number of seconds the colour comes back to the face, consciousness returns, the eyes open, and the patient has all the sensation of having died and come to life again. I have seen this occur every few minutes, and the attacks persist for several days. In two cases within my knowledge there have been repeated recurrences of the attacks at intervals of months and extending over a period of several years; both these patients are still alive.

In the **Cheyne-Stokes or respiratory type** the pulse becomes irregular, increased in rate, sometimes intermittent, while the respirations are gradually accelerated to a climax followed by a pause when pulse and respiration resume their usual rate; such attacks may be attended with pain, and almost invariably are associated with a certain amount of distress, but, unlike the former condition, do not suggest the imminent approach of death, although the prognosis is quite as bad.

Hearts that have suffered from rheumatic endocarditis with consecutive valve lesions may be so thoroughly compensated that all symptoms are lost, and it is not until advancing years bring in their train the inevitable muscular enfeeblement that the valve defect gives trouble. Stethoscopic examination, and the history of early acute rheumatism, make plain the nature of the case, and the only difficulty that can arise is from failure to recognize the fact that a definite valve lesion may remain so long latent. Yet there should be no doubt about it, and it was amusingly illustrated by a tale the late Sir Andrew Clark used to tell. He said that about the middle of the last century the chaplain to Guy's Hospital tried to insure his life, but was rejected on the ground

that he had heart disease. This depressing announcement so upset him that he wrote to the governors asking to be allowed to resign, and his request under the circumstances met with so much sympathy that he was retired on full pay, on which comfortable pension he lived for thirty years! Perhaps the story is not true, but anyway it is *ben trovato*, and serves to impress upon the minds of students one of the most important facts in clinical medicine, namely, the importance in itself of a valvular murmur, and the long time a heart so damaged may continue to do its work. The well-known tale of Sir William Gull points the same moral; it is so well known that it needs an apology for its introduction, but its meaning must be my excuse. Gull was seeing a patient in consultation, and noticed a heart murmur which had been overlooked by the practitioner in attendance, somewhat to his confusion. He endeavoured to express his regret for the oversight; but Gull cut him short by saying, "It's just as well you didn't notice it, as you might have treated it!" Probably in the present day there is a juster appreciation of the value of a murmur than there was fifty years ago, but there is always a danger of exaggerating the importance of a single sign, so that the discovery of albumen or sugar in the urine or even of tubercle bacilli in the sputa is too often made the basis of a grave prognosis.

Perhaps some who read this may be willing to admit the ambiguity of albumen and sugar, but are disposed to pin their faith to the definite significance of the finding of tubercle bacilli in the sputa. For their benefit I will relate another story. In 1891 I received a letter from a physician in a provincial town to say that he had seen a relative of mine, a

young unmarried woman about twenty-five years of age, who had had very slight haemoptysis, and in whose sputa he had found tubercle bacilli. Knowing that I was trying Koch's tuberculin, he suggested it as a suitable case, and proposed that I should ask her to my house for the purpose of examination, explaining further that in order to avoid giving her unnecessary alarm he had said very little to her. Our invitation followed, but was not accepted, as she was just going to London; but after a few weeks I received a letter from a London specialist enclosing a report on the sputa of the same patient by the pathologist to his hospital; this likewise testified to the presence of tubercle bacilli, and by a coincidence, which would be strange if it had not been the fact that Koch's discovery was very much in the minds of all of us, the specialist suggested that I should try tuberculin injections for the case. As I was not anxious to undertake the treatment of a relative, I suggested another opinion. She was taken to Dr. F. Roberts, who did *not* examine the sputa, but sent her to St. Leonards, and wrote to me to say he did not think there was anything much the matter with her. When she came to my house some months later, I examined her, and found no reason to doubt the soundness of Roberts' opinion. There was then no cough or expectoration, so that there was nothing to examine for tubercle bacilli; but that is twenty-one years ago, and the patient remains in perfectly good health. It is quite possible that there was a small focus of tuberculosis, especially as she had some enlarged glands above the clavicle; but the disease has remained quite quiescent all these years, and only harm would have come of exaggerating the significance of the single symptom.

Heart disease in the aged differs from that which occurs in adult life, by the fact that we cannot rely upon the recuperative power of the myocardium. In fact, the muscular wall of the heart in old people is a very easily damaged tissue, showing slight tendency to repair. All infectious processes harm it, and one of the most injurious is influenza. The "influenza heart" is a most definite pathological entity. Half my professional life was passed before the influenza epidemic returned to plague us, and during that earlier time I had paid a great deal of attention to affections of the heart, having worked with Dr. Balfour, and, guided by his teaching, I had fully appreciated the importance of the myocardium, so that I can say with some confidence that there was no condition in that period, that is, before 1890, which produced anything like the extent and frequency of myocardial mischief which has been seen since, but was perhaps more prevalent in the "nineties" than it is now. In its milder manifestations the patients do not complain of any symptoms that suggest heart trouble; they say they are weak, and often refer this to their legs; they will tell you that when out walking they want to sit down, but not because of oppression at the chest or shortness of breath. There is often pallor of the face, and a look of exhaustion; on examining the pulse it may appear to be quite regular, but if, instead of counting it for half a minute or a minute, the observation is maintained for several minutes, a few irregular beats will be detected, and will perhaps recur several times in the next minute. By good luck this irregularity may be encountered at once, but in many instances unless it is looked for it will be missed. A lady, aged thirty-eight, was seen by me in 1894; she had had a sharp attack of influenza,

for which she had been kept in bed, but had recently been sitting up in her room. As she made little progress, I saw her; she looked pale and ill, and on feeling her pulse its irregularity was manifest, but had not been noticed previously by her medical attendant. She was taking a little champagne, but this evidently increased the heart's disturbance, so was stopped. Eventually she went to Bournemouth, and by Christmas was quite well. She kept well for two years, and then complained to me of weakness, inability to walk, of feeling exhausted, and so on. On feeling her pulse, it was as it had been in 1894, and on inquiry it appeared that she had had a cold about a month before, for which she had been in bed a couple of days, but had not had medical advice as it did not seem to be at all important; but in all probability this cold was an attack of influenza, for the pulse was even more irregular than it had been on the previous occasion, and was much longer in recovering. I should add that on neither occasions was there any murmur or any displacement of the apex beat. Her recovery from the second attack was also eventually complete. Such attacks in old people are necessarily more damaging on account of the greater vulnerability of the heart's muscle, and commonly lead to dilatation, followed by all the symptoms of progressive heart failure. It is not implied that this is necessarily an immediate or rapid process, but what normally happens is that with rest and appropriate treatment improvement occurs, the apex beat may recede to its normal position, and for a time recovery appears to be established, but after six months or more relapse occurs without any very definite cause, and then recovery is more tardy and less complete; slight oedema of the ankles sets in

and persists, the heart's apex is displaced permanently, dyspnoea is experienced on going uphill and upstairs; gradually the heart ceases to maintain the circulation efficiently, and the whole cycle of symptoms succeeds, with Cheyne-Stokes breathing, general anasarca, obstinate insomnia, rapid irregular intermittent pulse, diffused apex beat, and often inconstant apical systolic murmur, pulmonary congestion, and oedema and death.

While I was writing what has gone before I was asked by telephone to see an old patient aged seventy-five, who has consulted me several times for slight ailments associated with mild glycosuria. I found him lying in bed pulseless, and I heard that he had seemed moribund when I was summoned, but had rallied a little; the immediate cause of his collapse was getting out of bed, which he had insisted on doing. It appeared that on Saturday last (this is Wednesday), he was attacked by influenza, which in a not severe form is prevalent this autumn, and his aged heart has succumbed to the toxins of a by no means virulent form of the epidemic.

It is then the state of the heart muscle that is of pre-eminent concern in old age, not because it is more important at this period than earlier in life, but because time has impaired its strength and has deprived it not only of the power of resisting disease, but of repairing its results. Why this should be so has been already discussed at some length, and the question has been left without adequate answer; we must for the present bow our heads to the indisputable fact and recognise its wide range in the pathology of old age.

The predominance of the myocardium is well seen in the course of chronic renal disease in the aged,

which seldom in itself would cause death if the heart held out, but a vicious circle is established, the failing heart diminishing the secretion of urine, and the resulting accumulation of impurities in the blood poisoning the heart and not infrequently bringing about the fatal termination by setting up latent pericarditis and pleurisy.

Angina pectoris or **heart pang** varies greatly in degree and presents an infinite multiformity of clinical aspect. It may be very slight, elicited only by unusual exertion as in walking up a steep hill, disappearing at once when the patient stops, and better described as oppression behind the sternum than as actual pain; from this it presents all degrees up to agonizing torment shooting from the chest down one or both arms, accompanied by sweating, mental anguish, and a sense of approaching death. The results of examination of the heart may be equally diversified; in some, and these are by no means the least serious, there may be absolutely nothing abnormal to be detected by the most careful exploration of the chest, while in others there may be pronounced signs of disease of the heart and great vessels. The former class, on account of their difficulty, are the more interesting and important to the student. An elderly man was sent into my hospital ward one day during my visit; he was able to tell us very little, and on examining him I could find no signs of disease, but he seemed in very poor condition from poverty and perhaps want of food. Just then the assistant physician who had sent him up came into the ward, and I asked him to go over the case, which he did, with the same negative result; but he said he had sent him at once without examining him, as when he was brought to the hospital he seemed to be dying.

I kept him in a few days, and while he was with us he took his food, made no complaints, and seemed well, so was allowed to go out. A few weeks later I found him again in the ward after another seizure. This time there was evidence of heart failure, which gradually got worse, and the man died with anasarca and effusion into the serous cavities. At the **post mortem** examination the heart was found to be in a typical condition of advanced fatty degeneration, the muscle was the colour of a dead leaf, very soft and friable. In another case, a middle-aged man, rather stout, had had an alarming attack of heart pain and faintness. He was a schoolmaster in comfortable circumstances, unmarried, leading a quiet, regular life. His family medical attendant agreed with me that there were no signs of any disease in the heart or vessels, yet a week or two later he died in another attack. There was no **post mortem** examination. Such cases, however, are not always so serious. A medical friend about forty years of age began to suffer from very unpleasant angina-like symptoms that came on usually after going upstairs. The attacks had come on several times after going up to a patient's bedroom. I could detect nothing wrong with his heart, and the late Dr. G. W. Balfour, whom he also consulted, agreed. I felt very uneasy about him, but his father, who was a medical practitioner, told me that he did not feel so alarmed about him, as at his age he had had similar attacks. The son recovered, and is still alive. He is about fifty-six, but has recently had some fresh signs of cardiac weakness in the form of faintings. The father died of angina pectoris after several renewed attacks, when he was seventy-three or seventy-four years of age. I ought to say that the son is an abstainer

and non-smoker. The latter is the more important, as tobacco is undoubtedly capable of producing symptoms very like angina even in young men when used in excess, and is especially liable to do so as old age approaches.

Tea and coffee also act as poisons to some hearts in the same way, and should be suspected equally with tobacco when such symptoms manifest themselves in hearts that appear normal on physical examination.

The pathology of these cases is in all alike, ischaemia of the heart from narrowing of the coronary arteries. This may depend upon atheroma of the aorta with obstruction of their orifices in the sinuses of Valsalva or upon spasmodic contraction of their walls. In the latter case, if neglected, the heart's muscle will degenerate and the case end fatally, but there is a good prospect of recovery when the toxin (tea, coffee, or tobacco) is withheld and the heart strengthened by appropriate tonics such as arsenic and iron.

During the attack the face, as a rule, is pale, the skin may be cold, and in severe cases is covered with sweat; the respiration is hurried and gasping; the pulse is generally small and quick, it is sometimes incompressible, and occasionally it is slow. The attack usually lasts only a short time; if, for example, it comes on when walking up a hill, it may pass away as suddenly as it came on when the patient stands still; but in other cases, especially where there is organic disease of the heart and aorta, it may last for a much longer time until arrested by the use of some remedy. It is especially in such cases that depressor drugs, *e.g.* nitrites, trinitrine, nitrite of amyl, or erythrol, are of signal service, and as prompt action is desirable a watery solution of trinitrine (one or

two minims in a couple of drachms of water), which can be carried in a little bottle in the waistcoat pocket, is to be recommended above all other remedies, being on this account preferable to chocolate tablets of the same drug.

A condition closely resembling angina has been observed to be associated with the growth of syphilitic nodes in the sternum, disappearing when they have yielded to the use of iodide of potassium. I remember the late Professor Dieulafoy showing a case of "angina pectoris" to his class at the Hôtel Dieu when I was in Paris in 1905, which I strongly suspect to have been of this kind. The patient, an elderly man, showed traces of past syphilis in his iris and choroid, and had syphilitic scars; nothing abnormal could be made out by the examination of the heart or pulse, but nevertheless the professor attributed his symptoms to disease of the "supra-sigmoidean" region of the aorta, that is, the region just above the semilunar valves. He expressed his decided preference for mercury over iodide of potassium for the treatment of syphilitic vascular disease, and while approving of mercurial inunction, recommended hypodermic injection of biniodide of mercury in doses of 0·01 (gr. $\frac{1}{6}$) to 0·02 (gr. $\frac{1}{3}$) grammes every night, under which remedy the patient had lost his attacks very promptly. A trial was not so satisfactory in my hands; the injections were painful, caused in some cases local inflammation, and did not exercise any therapeutic effect to compensate for these disadvantages. There is or was a fashion for hypodermic medication in France, a method which has its advantage, especially to the doctor, but is not free from such drawbacks as those mentioned.

It is very doubtful whether there is such a condition as "hysterical" angina, apart from actual malingering. That it may be feigned is possible. When I was a clinical clerk to the late Dr. G. W. Balfour, I often gave chloroform for anginal attacks to a woman whom he had repeatedly in his wards for "angina." She had been a nurse, she was, he believed, totally unable to work, and her case was used by him in more than one platform speech he made at that time in support of the scheme for establishing a home for incurables in Scotland, then being promoted by Miss Clugston, and on its establishment she was the first patient admitted. In the first edition of his "Clinical Lectures on Diseases of the Heart" (1876), her case is described in detail, and commented upon as one of true angina pectoris; but in the next edition the patient is mentioned by name as "a very clever impostor," who had given "a great deal of trouble before she was detected." It is possible that the detection might have been made earlier had there been the least suspicion, but she was an old patient of Dr. Balfour's; the diagnosis was accepted as a matter of course and never questioned. I remember another case of whose genuineness I now have my doubts; she used to come up for enormous hypodermic doses of morphia, and we used to keep a specially strong solution for her. Dr. Balfour believed in "hysterical" angina, but I have not met with anything deserving the name in the course of my practice.

Cancer of the heart as a primary condition is very rare, but eight or ten cases have been reported, in two of which the growth was a spindle-celled sarcoma, beginning in the right auricle and associated with haemorrhagic pericarditis. Secondary cancer is more

common, but is usually masked by the primary disease.

Marcel Goullier has studied the **arterial tension** in persons over sixty years of age suffering from tuberculosis, and has compared these with those in healthy old age. In the latter he found it varies from 175 to 210 millimetres of mercury, while in young adults with tuberculosis it ranges from 117·5 to 136, that is, it is generally under 140. In old persons with tuberculosis it was 170 and higher. If the tension falls below 140 it is of bad prognosis, and a rapid fall indicates some acute complication. If the tension is high it is due to the presence of arterio-sclerosis or renal disease, so that the effect of tuberculosis at all ages is to lower the arterial pressure.

Sir Clifford Allbutt believes that the arterial changes are not normal to old age, but that there is a condition which he calls senile plethora or hyperpiesis, of which the causes are unknown, but which bear some relation to suppressed gout. His statement that the blood vessels in old people are sometimes perfectly healthy is not based on any microscopical examination, but upon his observation that he has seen the blood pressure diminish under appropriate treatment, and he considers that if it were due to structural changes in the blood vessels it would be permanent. In this argument he omits to take into consideration the fact that the blood pressure must depend upon two factors: (*a*) the force of the heart, and (*b*) the peripheral resistance, and as (*a*) tends to diminish as age advances, a lowering of blood pressure does not necessarily prove the removal or diminution of (*b*); it may be, and more probably is, due to the reduction of (*a*). It is permissible to suspect that

Sir Clifford Allbutt has regarded the normal rise in blood pressure as a pathological condition, and the failure to maintain this later in life as its cure. Moreover, in his estimations of blood pressure he has relied on his finger, which, when unchecked by the sphygmomanometer, is in my experience untrustworthy.

Phlebitis or **thrombosis** of the veins of one or both lower extremities may follow an infectious process, but is liable to occur in elderly persons from gout, and is sometimes immediately occasioned by a slight injury. It is a troublesome affection, laying up the patient for months, and often permanently impairing his power of walking. It is not devoid of danger from displacement of the clot, so that absolute rest is essential for several weeks, and until the venous circulation is restored, which may never take place, the leg will swell when the patient is on his feet for any time. The support of an elastic stocking or bandage is necessary, at least, for a time.

Gouty patients should be restricted in their diet, the reasons for this being more imperative, as exercise is out of the question during the presence of the thrombosis.

CHAPTER V

Diseases of the Respiratory System

Epistaxis — Laryngitis — Cancer of Larynx — Bronchitis — Pneumonia—Pulmonary Tuberculosis—Pleurisy—Asthma.

Epistaxis.—Contrary to the opinion of Martineau, quoted by Rauzier, that the liability to suffer from **Epistaxis** disappears completely in old age, it is the fact that, if not common, it is by no means unheard of, and when it occurs may be profuse, dangerous, or fatal. Of 70 cases in which death is attributed to this cause in the report of the Registrar-General for 1910, 21 occurred at over fifty-five years of age, 8 being men and 13 women. When it is fatal it is usually associated with latent chronic nephritis or arterio-sclerosis.

Chronic laryngitis is not uncommonly met with in old people, especially in old men, probably as the result of much speaking, and the abuse of alcohol or tobacco. The Registrar-General's Report shows a slight excess in the number of deaths attributed to this cause in males over females per million living, and also in those over fifty-five years of age. The disease shows itself by hoarseness or loss of voice, with a tickling cough. Silence, abstinence from alcohol and tobacco, with the use of liquorice, liquorice and menthol, or benzoic acid lozenges, will allay the cough. Steam inhalations from a Maw's inhaler or spraying with steam to which half a drachm

of compound tincture of benzoin has been added, should be used frequently during any exacerbations.

Clergymen and other public speakers who suffer in this way may derive benefit from a course of treatment at Ems or Mont Dore, and if possible should spend the winter in a dry warm climate, *e.g.* Egypt.

Old people suffer much from "**bronchitis,**" that is, from cough with more or less expectoration, but in a great many cases the catarrh is confined to the larynx and trachea, although on a fresh accession of "cold" it is liable to spread deeper. In a considerable number of cases where there have been recurrent attacks of "winter cough," or where at some time one lung has been the seat of pleurisy with effusion, often undetected, there is dilatation of the bronchi marked by copious expectoration, especially in the morning. The former type calls for little drug treatment; it is often dependent upon "goutiness," and is relieved by abstaining from malt liquors, is aggravated by tobacco and by constipation. These patients are benefited by a mixture of mineral acid, nitric, or nitro-hydrochloric acid, with nux vomica and quassia, and Jephson's powder or compound confection of sulphur. (See Appendix Nos. 6, 12, and 13.)

A tickling cough is often relieved by sucking liquorice or chloride of ammonium pellets, or benzoic acid lozenges, or lozenges of liquorice with a little menthol, or sipping some acidulated drink, such as lemon juice or raspberry vinegar diluted with water, kept by the bedside.

When **Cancer of the Larynx** occurs in old age it usually assumes the type of cornifying epithelioma. The first symptom is some alteration of voice, it may lead to difficulty of respiration, to salivation, and to haemorrhage; there may be pain on swallowing. On

laryngoscopic examination a sessile, or sometimes pedunculated tumour, can be seen invading one vocal cord. The thyroid gland becomes hard and prominent. The disease makes slow progress and in some cases there has been difficulty in diagnosis. In one instance known to me, the larynx was opened for the removal of a supposed epitheliomatous tumour, but on touching the growth with the point of the knife it shelled out and proved to be a gouty deposit of uric acid cells. Although the only satisfactory treatment must be surgical, the risk is considerable from subsequent broncho-pneumonia and heart failure.

The death-rate of old people from **Bronchitis** is very high; this represents the truth in an exaggerated form, for many of these cases are deaths from chronic phthisis, heart disease, and Bright's disease, in which the bronchitis is only a symptom. According to the Registrar-General's Report it is accountable for twice as many deaths as the various kinds of pneumonia during the age decade 65–75, four times as many from 75–85, and five times as many in those above 85, but, making all allowances, its formidable nature must be admitted.

Bronchitis in old people generally takes its origin in winter cough as a catarrh of the larynx, trachea, and large bronchi; by the destruction of the ciliated epithelium of this part of the respiratory tract infection becomes easy and spreads deeper into the lungs; the repeated cough impairs the elasticity of the walls of the bronchi and air vesicles, while the senile changes in the bones and cartilages of the thorax allow over expansion of the lungs and the consequent production of emphysema and bronchiectases. The process is favoured by cold and damp, especially when the mucous membranes are predisposed to

catarrhal inflammation by the gouty habit, for it is common to find that the catarrh is not limited to the air passages, but affects more or less the nose pharynx and stomach as well. As its name implies, in the earlier years the patient gets rid of his cough with warm weather, but after the winter sets in he sooner or later catches a fresh cold and renews his cough. It follows the normal course of a catarrhal inflammation, and becomes serious only when the organic changes have developed which have been already described. In course of time the attacks become more severe, requiring rest in bed, regulated temperature, and confinement to the house for some time. When this stage has been reached it is most desirable that the patient should winter in a warmer climate, where it may be possible to escape the annually recurrent catarrh. No doubt, so soon as it is plain that the catarrh returns each winter, it would be a wise precaution to go away, but, as a rule, patients will not expatriate themselves until a sharp attack has made them realise that if they stay at home they will almost certainly be very ill.

Unhappily, there are many of our patients for whom it is impossible to leave England, and even a long visit to one of our native sheltered south coast watering places is out of the question. It is not much good to send these cases away for a few weeks only, as they will have then to return to the same unfavourable conditions. The alternative, as a rule, is being shut up in the house for most of the winter. Advantage should be taken of every bit of good weather, and in the absence of cold winds daily exercise should be encouraged. Any gouty tendency should be counteracted by diet (see Appendix II.), and in all cases a dry diet should be given a trial.

In the early stages of recurrent catarrh some benefit may be derived from vaccine treatment, but the immunity lasts only a short time, and the injections should be repeated at the beginning of each winter.

In cases with profuse expectoration, Mistura Ammoniaci in ounce doses, three or four times a day, is useful, and the patient should inhale at bedtime from a Maw's inhaler ten drops of turpentine or a teaspoonful of compound tincture of benzoin in half a pint of boiling water. In using the inhaler the patient is apt to find it tiring if it is persisted in for more than a couple of minutes or so, after which there should be a rest, and the inhaler wrapped in flannel to keep it hot, the process being resumed from time to time, ten minutes or a quarter of an hour in all being devoted to the operation. The old-fashioned remedy, tar water, should be given a trial; it may be used as a drink with meals, as I have seen it supplied in old-fashioned Paris restaurants, the tar being put in a jug which is filled with water and refilled as it is emptied. Tar pills or capsules may be ordered for those who do not like its taste. Syrup of tar is another mode of administering this really useful remedy.

When the smaller bronchi are involved the case is more serious, demanding rest in bed in a room kept at an equable temperature, careful nursing, low diet, a jacket of spongiopiline wrung out of boiling water and sprinkled with linimentum terebinth acet., a laxative, and a mixture of carbonate of ammonia, squill and senega. (See Appendix I. No. 16.)

Tincture of digitalis in ten minim doses is a useful addition to this mixture, and turpentine may be given to inhale in the manner already described.

The diet in acute bronchitis must be regulated in accordance with the state of the digestion. Beef tea or invalid bovril, chicken or veal broth is a useful stimulant, and contains nothing to tax the digestive powers, but is also destitute of any food value, yet for a day or two may be sufficient to keep the patient going if a pint or a pint and a half can be taken daily. White wine jelly, or arrowroot, made with water and flavoured with a tablespoonful of brandy or sherry to the half pint is pleasant to take, and contains some nourishment. Still better is an egg beaten up given in coffee, and sweetened with crushed sugar, to which a little brandy may be added if desired. Where there is some desire for food and the tongue is clean, thin bread and butter, white fish soufflé or veal or chicken quenelle, or veal chicken or fish cream may be allowed. There is every reason for allowing solid food of this kind if it can be taken; the directions for making these dishes will be found in Appendix III.

Acute Pneumonia is one of the most insidious, rapidly fatal, and common affections of old age. Probably the majority of old persons who are said to die of old age really succumb to a latent attack of this disease. It is no doubt caused by infection with the pneumococcus, but the attack is favoured by depressing agents, such as cold, or the presence of other infections, *e.g.* cystitis. The absence of symptoms explains the fact that it is so often overlooked. Charcot taught that there is no rigor nor any pain, rapid breathing, rusty sputa, cough or fever. There may be a moist, clammy skin with a weak rapid irregular and intermittent pulse. The tongue may be dry, vomiting or diarrhoea may be present, the urine is diminished. The patient is often somnolent, becoming comatose or there may be

muttering delirium. With regard to the fever, Charcot said that although the axillary temperature may be normal or subnormal, the rectal temperature will be found to be raised. According to Savill it is the most common cause of death in the aged. It is most frequent in the winter, occurs generally on the right side, and in 65 per cent. of the cases at the apex. The pre-disposing causes are bronchitis, congestion, myocarditis, emphysema, Bright's disease, alcoholism, and general debility. The liability to it increases with age, but is equal in both sexes. The physical signs are the same as in adult life, but less intense. Lafon, who has had a large experience in Oppenheim's service, admits that the functional symptoms are less marked, but found the disease less latent than Charcot described it to be. In 47 cases there was a rigor in 19, pain in 32, and in all difficulty of breathing or dyspnoea; the sputa were rusty or greenish and under the microscope showed polynuclear leucocytes, red cells, and pneumococci; coarse crepitation and bronchial breathing were generally present, there were always sub-crepitant râles, and pleurisy was frequently observed. The pulse was rapid and sometime irregular, the tongue was dry and coated, the patient's aspect was anxious, cyanosed and dull. Herpes was rare. The urine was diminished, usually albuminous, chlorides were diminished, and out of 10 cases examined, in 8 urobilin was present; the general condition was bad, and prostration was frequent. In 18 cases the temperature reached 104° in the mouth and 102·2° in the rectum. The axilla gives lower results owing to the feeble circulation in the skin. He distinguishes the following special forms: (1) those with prostration; (2) those with hallucinations and tremor; (3) latent; (4) abortive;

(5) cerebral with delirium; (6) apoplectic with hemiplegia.

The gravity of the disease rises rapidly with age, with the presence of Bright's disease, or of any heart affection. Both sexes suffer, although the male shows a constant excess, but the highest mortality per million living occurs in both sexes during the same decade, from 65 to 75.

In 1909 Dr. Seibert of New York recommended the treatment of pneumonia by the hypodermic injection of 20 per cent. camphorated oil (Appendix I., No. 17) of which he gave 12 c.c. every twelve hours, or 4·80 grammes of camphor daily. Professor Oppenheim gave it a trial in his service of old persons over seventy years of age, and considered that the results were better than those he had obtained previously with other remedies. It has also been tried by Dr. Lafon at the Maison de Nanterre, and in the services of Dr. Sapetier and Dr. Langier. Dr. Lafon, after condemning bleeding, blisters, and antimony, and rejecting ipecacuanha and senega as of little use, allows that digitalis is useful where the heart is weak. He regards vaccines and sera as in the experimental stage. He does not believe in any antipyretic treatment, except perhaps cold compresses to the thorax. Alcohol and quinine are useful as stimulants. He obtained no good from the use of metallic colloids. He believes dry cupping is useful, but he places camphor in the first rank as a remedy. He says this drug was first used by the Arabs, but for its hypodermic injection priority must be given to Alexander of Berlin who administered it as a heart stimulant. He quotes Seibert as saying that the remedy does not cure by provoking the crisis, but brings about a progressive improvement. Lafon used sterilised capsules

of 5 c.c. containing each 1 gramme of camphor. These doses were encouraging in their results and were carried up to 3 or 4 grammes of camphor daily; he preferred to give small repeated doses rather than one large single dose. In no case did he observe any poisonous symptoms. His results were not so brilliant as those of Seibert who claimed never to have lost a case, but his patients were largely vagabonds, beggars, and broken-down humanity, often alcoholics and the subjects of Bright's disease and arterio-sclerosis. He lost 30 per cent. out of 41 cases, of which 38 were typical pneumonia and 3 broncho-pneumonia with grave symptoms. He gives as the average mortality published by other observers 43 per cent. from fifty to sixty years of age, and 64 per cent. above that age. He lost only 4 out of 20 below seventy years of age, or 20 per cent., while above seventy he lost 8 out of 18 cases, or 44 per cent. He compares these results with those of previous years in the same institution when camphor was not used, and the mortality was 50 per cent. He confirms Seibert's statement of the absence of a crisis, but he claims that camphor produces gradual improvement of the general condition with diminution of the toxic symptoms, gradual fall of temperature, increased diuresis, diminution of dyspnoea and thoracic pain while it strengthens and regulates the action of the heart. Seibert and Scheffler think it acts specifically on the pneumococci, as shown by their disappearance from the sputa. Under Seibert's inspiration Dr. Hensel found that one ten thousandth part of camphor arrested a culture of pneumococci. Dr. Welsh killed in thirty-six hours a series of rabbits by injecting an emulsion of pneumococci, but in another series similarly inoculated he gave 1 c.c. of 20 per cent. camphorated oil one hour

after the inoculation, and although all died, most of them lived for forty-eight hours, and one for nine days. Lafon found that the previous injection of camphor prevented a lethal dose of pneumococci from killing a mouse. He is unable to confirm the germicide effect of camphor, but thinks it acts as an adjuvant to the antibody. He regards it as prudent in all cases to determine the permeability of the kidney before giving large doses, and he recommends that the camphor should be continued after the temperature has fallen.

Lesions of the pleurae in old men are, according to L. G. E. Perchepied, exceedingly common, as he found them in 91·8 per cent. of his autopsies. He found the membrane usually to show loss of polish, a slaty colour and the presence of milk spots generally near the apex. There were also lenticular spots like tubercle, but less transparent and prominent; they were really minute milk spots. The more general kind of milk spot varies in size from a sixpence to the palm of the hand, and is situated on the parietal or viscera pleura or both. Adhesions were common and sometimes caused complete union of the two surfaces. He also described fibrous bands which constrict the long tissue as if it were tied up with string, and at other times they give a shaggy appearance to the surface of the lung. Tubercular lesions were common, and he remarks upon the predominance of fibroid changes so that the tuberculous structure disappears.

The non-tubercular lesions he describes are fibrinous false membranes, which are unorganised and non-vascular and newly-formed membranes with villous prolongations, but vascularised.

In discussing the origin of these changes he says

that of his 157 cases 69 were in tubercular subjects and 88 in non-tubercular. In the former the presumption is, of course, in favour of the lesions having had a tubercular origin, but this is not certain. In the latter, the non-tubercular cases, he finds two groups, one with pulmonary disease such as bronchitis, congestion, and pneumonia, but in 44 there was no history of pulmonary or pleural affection and no trace of tubercle at the autopsy. Various causes may be ascribed such as arterio-sclerosis, heart disease, kidney disease, toxaemia, and general infections, especially tuberculosis. Perchepied does not believe that all these patients had suffered from tuberculosis. He thinks the lesions more likely to be due to wear and tear depending upon advanced age and lessened vitality; he sees in them, in fact, a dystrophic sclerosis in which the cells revert to the simple connective tissue type.

Another recent French author, R. Crépin, has observed the prevalence of pleuritic affections in old age, and gives the results of the observation of 2000 old persons in the wards of Dr. R. Oppenheim during two years service as "interne." Among these patients 64 cases of pleurisy occurred; the symptoms were in great part latent, but dullness and dyspnoea were hardly ever absent. He says that sero-fibrinous pleurisy in old age is generally tuberculous, but that the pleurisy which occurs in pulmonary congestion and pneumonia is often haemorrhagic or purulent, but he recalls the fact that Leo XIII. died of haemorrhagic pleurisy at the age of ninety-three, and that this was of tuberculous origin. He thinks tubercle plays the chief part in the pleurisy of old age. Out of 54 cases that went to autopsy 48 showed definite tubercle.

Pulmonary Tuberculosis.—According to Barié, 10 per cent. of the deaths from pulmonary tuberculosis occur after sixty years of age. According to the Registrar-General's Report for 1910, the total deaths at all ages in England and Wales, from pulmonary tuberculosis were 20,792, of these 2840, or more than 13 per cent., were over fifty-five years of age. The English figures are not satisfactory, owing to a large number of cases registered as "phthisis without any other indication" being excluded from this return. It is believed that these old persons have usually become infected earlier in life, but in many the infection takes place later. In one family the grandmother developed tubercle of the larynx and died, the grandchild, a baby, soon after developed tubercular meningitis which proved fatal, and lastly the mother, a young married woman, showed signs of pulmonary phthisis which fortunately cleared up under sanatorium treatment. Owing to the latency of the symptoms the disease is often overlooked, although writers who have dealt especially with old age have invariably recognised its frequency. Le Coz in his recent thesis says that 72 per cent. of his old patients gave a positive Calmette reaction yet only 16 showed signs of tubercle, and out of 2202 aged persons only 2·29 per cent. were certified as dying from tuberculosis. Of 330 autopsies on the bodies of old persons performed by Dr. Le Coz in eighteen months, 246 showed indisputable lesions of pulmonary tuberculosis, of which 143 were healed and 103 active; but 60 only had died directly from the effect of tuberculosis. He found the lesions in old age to be identical with those of adult life, but the disease is often latent, in others it is revealed by cough, purulent expectoration, pain in the chest,

violent dyspnoea and haemoptysis, muscular weakness, enfeeblement, general debility and raised temperature. He recognises two distinct forms, (1) acute tuberculosis either local or general; (2) chronic. He thinks the diagnosis is generally difficult by ordinary clinical methods, and therefore proposes a wider adoption of Mantoux's intradermal tuberculine reaction. One drop of a 1 per cent. dilution in 50 parts of normal saline is injected into the skin which is pinched up in a fold; a positive result is shown by a red indurated spot surrounded by a pale halo, which develops in twenty-four to forty-eight hours, lasts four to five days, but may be slower to appear and to disappear. Of his 330 autopsies, 138 cases had had the intradermal injection, of which 114 were positive, in only 5 of these 114 could no tuberculous lesion be found, 24 had given a negative result, of these 15 showed tubercle. He explains the discrepancy by the cachectic condition interfering with the reaction. He lays stress on the importance of discovering these cases in order to prevent the dissemination of the tubercle bacillus. As bearing on the latency of tuberculosis in old age, Maclachlan mentions cases of sudden death from haemoptysis in aged phthisical patients who had never been suspected of being consumptive.

Crépin, who has had the large experience of looking after 2000 old persons in the service of Dr. R. Oppenheim, says that there was indisputable tubercle, generally at the apex of the lungs, in 76 per cent. of his autopsies. There is constantly little cough or expectoration, and when these are present they are regarded as bronchitic; fever is often absent, or the temperature is subnormal; the pulse may not be quickened, there may be no sweating, and although,

as a rule, there are positive physical signs, and tubercle bacilli may be found in the sputum, these are not uncommonly absent. Haemoptysis may occur, but is unusual. Apart from this remarkable quiescence, the disease in its course does not differ from that of adult life. It is probably in most cases of long standing, and runs a chronic course, favoured by the inactive life led by old people. If they could be made to take a sharp walk there would probably be fever, and the formation of antibodies; but under the conditions in which they live the disease makes constant progress without giving rise to symptoms.

Where there is sufficient vitality to make it possible to carry out rational therapeutic measures these may be tried, but as a rule treatment can be only palliative. As much open air as the season and climate allow, good ventilation, warm light clothing, plenty of simple nourishment without overtaxing the digestive powers, small doses of alcohol, especially port wine, cod-liver oil, and minute injections of tuberculin administered very cautiously at intervals. The most useful drug is quinine and a cough linctus may be necessary. (See Appendix I., Nos. 18 and 19.)

Rubbing the chest with linimentum terebinthinae aceticum, and wearing a jacket of gamgee tissue tied with tapes over the shoulders and at the sides of the chest add to the comfort of the patient.

True **Asthma** is by no means in any special degree a disorder of old age. Indeed it is often wrongly diagnosed when the real mischief is in the heart or kidneys or both, or there is latent disease of the lungs or pleura.

The subjects of true asthma often lose their liability or suffer in a diminished degree when they have reached old age, yet they are not immune, and

sometimes an attack of influenza will leave asthma as a permanent legacy to an old person who has never had it before.

Asthma is a reflex spasm starting from the mucous lining of the air passages or of the alimentary canal, and depends upon a special irritability of those surfaces to agencies, some of which are known but more are unknown. We know that the pollen of hay and certain other flowers has this effect: we know less precisely that the emanations from certain living animals, cats, horses, and from the furs or skins of dead animals will in susceptible people bring on an attack. A young girl was brought to me by her mother for asthma; the attacks had begun quite recently, and could be fixed as having commenced since she had left school and had accompanied her mother and elder sister to their shop (they were furriers), where her business had been to sew furs; by my advice she found another occupation, and the attacks ceased.

But even clean straw may cause an attack, as was the case with a friend of mine who could not sleep over a straw paillasse. On one occasion when he was sleeping in a lodging he suffered from asthma, which from previous experience he attributed to the straw paillasse on the bed. He asked that it should be removed, and saw that this was done, yet on going to bed he suffered as much as on the previous night. He searched the room and discovered that the paillasse, although taken off the bed, had been put into a cupboard! After its removal he obtained relief.

By analogy we assume that there is some particular emanation that irritates the lining of the air passages, probably in the nose, for the same patient on another occasion had a violent attack of asthma induced by

the lining of his nose being touched with a probe. How are we to explain those cases which seem to occur from change of altitude? We stayed at Braemar some years ago in the same house with a young lady who came down each morning looking so ill that my wife asked her what was the matter? The poor girl said she had had asthma every night, that she was not at all subject to it, but had had it once before when staying at Montreux! Braemar is 1200 feet above the level, and Montreux is 2000, so that in this case sleeping at a moderate but unusual height for the inhabitants of Great Britain seemed to be the cause. I have known several cases where moving to a lower level, especially to the sea level, or being on board ship, has brought on violent asthma in persons subject to the attacks, or less commonly in those who have never previously suffered from the attacks.

Personal idiosyncrasy is the only expression we can use by way of explanation. I knew a family in which one of the sons suffered from asthma whenever he stayed at their London house, and at a shooting lodge in Wales, but was quite well at their home in Staffordshire, and at his school at Marlborough; I cannot tell what was common to either of these groups, or how to explain his immunity in one and susceptibility in the other. A butcher in Birmingham suffered from asthma, and was advised by his family doctor to move, but to experiment before doing so by taking a lodging near the place he intended to try; he heard of a business for sale in a part of the city about 200 feet higher than that in which he lived, found he was free from asthma there, so bought the shop and moved his family; after they were settled in the new house his little boy, aged five, developed

asthma, of which he had shown no previous symptoms; he was sent to live with his grandparents in the country, and remained free.

It is well known that indigestible food, if eaten in the evening, may bring on an attack, and conversely that an emetic will cut short a paroxysm. I was once asked to see in consultation a little boy about three or four years of age whom I found sitting in the middle of a large bed panting in a paroxysm of asthma, which had already lasted a good many hours. In order to give him relief we ordered him a small dose of morphia, and it was arranged that I should see him again in the evening when the family doctor called, but as I lived very near I was to be sent for when he arrived. To my disappointment I was not called; but the following day I learned that the first dose of the medicine made the child sick, but produced so much benefit that a few hours afterwards a second dose was given, with such good results that when the doctor came in the evening the little patient was quite well!

I remember a hospital out-patient who told me that when his asthma was very obstinate he cured himself with an emetic of mustard and water. Fasting is not likely to be a popular cure, but it is fashionable at the present time, and is undoubtedly a rational remedy for asthma.

In Guelpa's book he quotes a case which may be given in illustration: "M. de W., one of our most popular men of letters has suffered for a long time past from severe and prolonged attacks of dyspnoea, which for weeks together make his life a misery to him, especially at night. He had been in this condition for three weeks, and there seemed to be no likelihood of improvement when he came under my

care. As I had noticed in several cases the peculiar efficacy of the disintoxication treatment in congestive affections of the respiratory system, I urged the treatment upon him, assuring him with absolute conviction that his pains and discomforts would all take their departure on the first or second day of treatment. He preferred to wait, rebelling like a true gourmet from a treatment involving abstinence from food for three days, and fearing the weakness he felt certain it would cause. The dyspnoea increasing, however, in spite of all ordinary treatment, he at last decided to follow my advice. The pulmonary congestion and dyspnoea showed marked improvement at once, so much so that after an interval of three days the patient repeated the cure" (pp. 70–71). Guelpa's treatment involves besides entire abstinence from food the absorption daily of a whole bottle of Hunyadi Janos water. A good many readers may sympathise with the reluctance of M. de W. to submit to this regimen, but I believe it to be rational in principle, and I intend to give it a trial when I get a case of persistent asthma such as this was.

In the *treatment of asthma* we must, in the first place, if possible, discover the cause and remove it if we can. A change of residence may often be sufficient. For example, a young man was sent to me by his employer on account of asthma; he had only suffered from these attacks since coming to Stafford; he had lived the rest of his life at Lilleshall in Shropshire. As he appeared free from any other sign of disease and I could discover no special cause, I asked him whether he lived near the river, and finding that he did I advised him to get a mile away from it. After some hesitation he followed my advice, and a year later his employer sent him to me to

report that he had no return of his attacks. In the case of a little girl who lived in Worcester her parents, on my advice, took her to live about five miles out of the town in a higher situation, with, as a result, a complete cure.

It is not always in one's power to secure a trial of this kind; too many people are anchored to the places in which they earn their living. In every case where a move is advised it must be tried experimentally in the first instance, and no serious or irretraceable step taken until its success has been proved.

If there is no apparent cause, and change of residence is unsuccessful or impracticable, the prospect of complete cure is much less promising. The nose should in all cases be examined for polypi, etc., and any definite abnormality corrected, but the removal of portions of the septum or turbinate bones is not recommended.

The diet should be light, easily digested, and moderate in quantity; above all, these points should be insisted on with regard to the last meal in the day, which should not be taken later than seven or eight o'clock. It should not include vegetables or fruits in an uncooked state, butchers' meat, a succession of dishes, or any wine; it is better to abstain from tea and coffee in the evening; tobacco acts so differently on people that no rule can be laid down; thus Trousseau who did not smoke habitually found relief from a cigar during his paroxysm of asthma.

In the treatment of asthma we must consider the therapeutic means we may employ (1) to prevent the attacks, and (2) to cut short or alleviate the paroxysm when it is present.

Apart from or in addition to any remedy suggested by the diathetic or constitutional condition of the

patient, the specific remedies that have gained the confidence of the profession are iodide of potassium or sodium, arsenic, belladonna, or atropine and lobelia; these may be combined in one mixture or given alternatively in courses lasting two or three weeks. (See Appendix I., No. 20.)

If the case is complicated by bronchitis we may prescribe a mixture containing squill as an alternative. (See Appendix I., No. 21.)

When medicines are ordered three times a day without reference to meal times they may be taken at 10 a.m., 4 p.m., and 10 p.m.

In all cases the state of the bowels should be considered, and a laxative ordered where necessary. The compound liquorice powder is one of the best as it contains sulphur, a drug that has an established reputation in bronchitic chest complaints.

Some of the above drugs, notably arsenic, atropine, and belladonna, may be conveniently ordered in a pill. (See Appendix I., No. 22.)

Counter irritation is sometimes beneficial. Graves recommended the nape of the neck and the upper part of the chest and back to be rubbed with the linimentum terebinthinae aceticum, and I have observed remarkable benefit from painting the neck with iodine along the course of the sterno-mastoid muscles.

Grindelia robusta (or squarrosa) given in the form of the liquid extract has seemed to me to be distinctly useful as an ingredient of an anti-asthmatic mixture, but as it contains an oleo-resin it requires something to suspend it such as mucilage or mistura amygdalae.

Slight tightness of the chest may be relieved by spraying with solutions of adrenaline (1 : 1000) in oil; cocaine (2 per cent.) with chloretone or atropine

as in Martindale's " compound asthma fluid." A few puffs of one of them into the nares and pharynx will in many persons arrest an impending attack. The inhalation of the fumes of stramonium, datura, lobelia and nitre is very effectual. The formula given by Martindale contains nitre lobelia stramonium, black tea, and a little oil of anise, and is well known as pulvis lobeliae comp. (Martindale). The powder should be burned on a tin plate in the patient's bedroom before going to bed and the fumes inhaled. Cigarettes made from arsenicated paper, or containing datura tobacco or stramonium leaves are used for the same purpose. Pyridine, which is probably the relieving agent in the fumes of the various remedies that are inhaled by burning, can be obtained. A drachm of it is placed on a plate in a small room where the patient should remain for from twenty to thirty minutes three times a day.

The late Dr. Steavenson, who was an asthmatic, claimed to get the most speedy relief from a hypodermic injection of morphia; but while this advice may be followed with advantage under certain circumstances by a medical practitioner, it is not advisable to leave the hypodermic injection of morphia to the discretion of any patient.

CHAPTER VI

The Diseases of the Digestive System

Diseases of the Mouth—Teeth—Tongue—Oesophagus—Stomach—Gastritis—Flatulence—Plastic Linitis—Phlegmonous Gastritis—Dilated Stomach—Gastric Cancer—Stomach Surgery—Functional Diseases of the Stomach.

The Mouth

The disappearance of the teeth as age advances can hardly be regarded as other than a normal phenomenon due to absorption of the alveolus. But these changes are frequently accompanied or hastened by pathological conditions, especially by pyorrhoea alveolaris, a septic infection of the marginal mucous membrane which causes exposure of the unprotected dentine, the formation of small cavities in the sides of the roots, periostitis with pain followed by extrusion and loosening of the teeth and impaired mastication, involving ultimately their necessary removal.

Much discussion has taken place about the cause of this affection without very satisfactory results. It occurs in persons with whom the use of the tooth brush and antiseptic tooth powder is habitual from childhood, who also are accustomed to have their teeth examined and defects remedied at regular intervals by competent dentists. It is so common that few persons after middle life are free from it.

We are told that it is due to the detritus of food lodging in the interdental crevices and so affording a nidus in which septic bacteria may grow ; the only rational prevention that has been suggested is the thorough cleansing of the teeth after eating, a counsel of perfection opposed to our social conventions, although our neighbours the French have the good sense to follow it.

Partial loss of the teeth is more harmful than toothlessness, for in the latter condition mastication is to some considerable extent possible, unmasticated pieces of food are readily recognised, and bolting is not involuntary, but a mouth with gaps in the teeth finds mastication difficult, while the involuntary swallowing of unmasticated pieces is hard to avoid as they may so easily lie in the gaps undetected. For this reason the teeth must always be examined in all cases of disordered stomach ; some of the worst symptoms of gastric trouble may be produced by swallowing unmasticated food, especially meat, for the human gastric juice acts quickly only on finely divided muscular fibre.

The **salivary glands** are reduced in size, and old people often complain of dry mouth from deficiency of saliva. The condition of dry mouth called Xerostomia by Sir Jonathan Hutchinson, who first described it, is due to failure or diminution of the salivary secretion. According to Hall, out of 59 cases 18 were over fifty years of age. It is usually attributed to nervous causes, but both enlargement and atrophy of the parotids and submaxillary glands have been noted.

Treatment has not been of much use, but galvanism and small doses of pilocarpine (gr. $\frac{1}{12}$) should be tried.

The tongue in old age is liable to be injured by the stumps of carious teeth, causing ulcers which may degenerate into epithelioma. Smoking is also apt to produce a sore tongue.

A little known condition is that called **Melanotrichia Lingualis**, where there is a black patch on the dorsum of the tongue presenting elongated papillae which become horny.

The condition called **Pityriasis Lingualis** is that in which the tongue presents exfoliated serpiginous patches tending to spread over the whole tongue until it is uniformly smooth, but as the papillae grow the process recommences; very little that is definite is known about its causation, but it is usually associated with acid dyspepsia.

Psorasis Lingualis or **Leucoplasia Buccalis** is the name given to white patches occurring either on the tongue or on the insides of the cheeks or lips. As it occurs almost exclusively in men it is believed to have some relation to smoking. It is also regarded by some as syphilitic. It may undergo epitheliomatous degeneration, or disappear leaving fissures and scars.

Thrush or **milk mouth** is frequent in the aged, in the course of acute disease, cachexias and chronic infections. Epidemics occur in hospitals and asylums for the aged in which the parasite oidium albicans may attack other mucous surfaces besides those of the mouth, even spreading into the bladder.

Various forms of **stomatitis** occur, usually of septic origin, such as uraemic and diabetic stomatitis.

Cancer may affect the floor of the mouth, the soft palate, tonsils, larynx, lips, and tongue.

Cancer of the oesophagus is wont to attack

elderly people and is more common in men than in women; it is commonly situated at (1) the junction of the pharynx with the gullet; (2) the point of meeting of the middle and lower thirds; or (3) the cardiac opening; but the whole length of the viscus may be involved. The first symptom noticed is some difficulty in swallowing solid food, but there may also be pain behind the sternum. If in an elderly person an obstruction can be felt on passing a softened gum-elastic bougie, and there is no history pointing to a foreign body or injury likely to be followed by cicatricial contraction, the diagnosis of cancer is pretty certainly correct, although it is always worth while to try the effect of treatment by large doses of iodide of potassium for a few weeks. The diagnosis must of course be assisted by a careful examination of the chest to exclude the presence of aneurism or other external tumour pressing on the canal. Simple spasm does not resist the passage of the bougie.

The *treatment* is limited to feeding with such non-irritating food as can be swallowed; it should not be too hot or too cold, or be composed of matter which cannot be reduced by mastication to a soft pulp. When only liquids or semi-liquids can be swallowed these should be of the most nutritious kinds, such as egg beaten up with milk, bread or rusk beaten to a pap in milk, pounded meat or fish, purées of potatoes, and other vegetables made up with butter and cream, and carefully sieved to remove any solid particles. As a rule, cancerous strictures are sufficiently permeable to permit of a fair amount of nourishment being taken, death resulting from the cachexia due to the disease and not from want of food. Symonds' tubes are not advisable; they may cause pain and bleeding, are difficult to keep in position, and they

irritate the growth. If swallowing an adequate amount of food by the mouth becomes impossible, it is better to have the stomach opened and to feed by a tube through the artificial stoma, but it is rarely that this is necessary in cancerous stricture of the gullet.

Cicatricial stricture, the result of the accidental or suicidal swallowing of corrosive fluids or injury from the impaction of a foreign body such as an artificial denture, may of course occur in an old person. The history establishes the diagnosis, and the treatment must be by dilatation when this is possible or by gastrostomy when the stricture is impermeable. Fibrolysin injections may be tried as an aid to dilatation. It is not advisable to begin any oesophageal dilatation until some months have elapsed after the injury, as it is not very uncommon for a perioesophageal abscess to form which may burst into one of the pleural sacs or the pericardium or into the gullet itself, and although such an accident may occur altogether independently of any attempt at dilatation, this would be likely to be blamed if it had been made. The feeding of these cases must follow on the same lines as that described for cancerous stricture. The various cookery recipes in Appendix III. for creamed chicken and fish, quenelles and panades will be found useful in these cases.

The Stomach

The dyspeptic troubles, which so often plague men and women during the more active period of life, abate strikingly in old age, mainly because they depend so largely upon nervous influences. Fatigue is a great factor in the production of digestive

derangements, but with diminished activity fatigue is seldom experienced; such injurious fatigue is more often the result of excessive labour of mind than of body, but when it is present it is only made worse by bodily exercise. Many a man has suffered from the advice of his friends when after a day of hard mental work he has tried to take that round of golf or good long country walk which has been recommended as calculated to stir up his liver. They are no doubt a minority, but there are many even among Englishmen who cannot take exercise on their working days with benefit, yet these same men can on a holiday enjoy a long walk and suffer no ill effects from it.

Yet while elderly people gain in this direction, they stand to lose from the **inefficiency of their teeth**, a matter often neglected from the dislike of wearing artificial ones. This very natural aversion should be conquered, and the assistance of the dentist sought early, for a mouth which has wide gaps in it is capable of doing more injury to the stomach than one without teeth; in the latter case mastication may be inefficient, but it is noticed, and tough pieces of meat are taken out of the mouth; but where there are gaps the unmasticated meat may be swallowed undetected, and, as it cannot readily be digested or pass the pylorus, it remains to cause local irritation. Under these circumstances the stomach may become so sensitive that all food is rejected, and the gravest suspicion of cancer may be aroused; yet all these symptoms disappear on suitable diet with sedatives in the course of a short time, and will not recur if properly fitting teeth are provided and care is taken that only well-masticated food is swallowed.

Acute or **subacute gastritis** is generally due to

some definite error of diet, but it may and does not uncommonly occur as a sequel to an infectious process of which catarrh is the most frequent. The symptoms vary very much ; appetite may or may not be absent, the tongue is usually coated ; taking of food is followed by pain which may be burning or aching, and which comes on very soon ; it is only in the severest cases that there is any vomiting ; when it does occur it points to poison, usually no doubt a food poison, such as may be found in decomposed fish or fruit. One summer evening about ten o'clock a young man and woman asked to see me ; the man was so collapsed that finding he was a clerk living in lodgings, and she, his sister, a governess or companion who had to go back to her employer's house, I sent him to the hospital which was near, where he had to stay for forty-eight hours. The sister told me that they had been to play tennis at a friend's house in the country, and after the game had taken supper at which her brother had eaten some sardines. Coming back in the train he had vomited, and although he had tried to walk from the station, on passing my house they had come in as he felt he could go no further. I tried to get the incriminated sardines, but they had been thrown away, which was a pity, as I know of no case in which French sardines have been proved to be poisonous, although they are eaten in such enormous quantities all over the world, quite as much if not more in hot countries as in temperate climates. Vomiting is really remedial, as it removes the peccant material, and if assisted by copious draughts of warm water will probably effect a complete cure ; the only further treatment needed being abstinence from any food likely to cause irritation for the next forty-eight hours.

Hot water is the best of all remedies for acute or subacute gastritis; it soothes the pain, dilutes the poison, delays its absorption, facilitates vomiting or washes the stomach contents into the intestine. There is seldom any need to use the stomach tube, which is peculiarly disagreeable, and not always available; in fact, it should be reserved for those cases where the patient is unable to drink or where there is urgent reason for removing the contents of the stomach at once. The stomach tube is an overrated instrument; it has played an important part in the study of diseases of digestion, and has been an invaluable aid to diagnosis, but it can easily be dispensed with as a means of treatment. Its introduction into the tender inflamed stomach is surely not conducive to recovery, and would be unadvisable on this score if there were no other objection; where it is merely desired to wash out the stomach this can be done as effectually with plenty of warm water and a feather or a finger to the back of the pharynx.

After the stomach is emptied either upwards or downwards abstinence is the most rational proceeding for the next twenty-four hours, but thirst may be allayed by hot water or a demulcent drink such as hot linseed tea or hot barley water. It is not advisable to give bouillon or beef tea, which may stimulate the flow of gastric juice, but whey or sugar water may be given. The next day bread and milk or oatmeal gruel or egg beaten up with milk may be allowed in small quantities (4 oz.) at a time, but no alcohol or condiments should be permitted. Tea infused with milk or café au lait or cocoa need not be refused if pressed for, but the less that is put into the stomach for forty-eight hours the speedier will

be its recovery. That the patient's subjective sensations are no sure guide to the state of the stomach is proved by Beaumont's observation that St. Martin had a good appetite and felt well when the lining of his stomach, as seen through the opening in his chest wall, was intensely red, covered with mucus, with here and there traces of blood, and strewn with little follicular or aphthous ulcers. After the second day the patient may be allowed to take such a diet as No. 1, and for some weeks should avoid all the articles forbidden in this table. (See Appendix II.)

The bismuth mixture (No. 3, Appendix I.) should be ordered to be taken three times a day before food, and two grains of calomel may be given in the morning of the first day before any nourishment has been taken into the stomach. The calomel should be placed on the tongue and washed down with a few sips of hot water. The mixture may be continued for a week when, if all symptoms have disappeared, it may be stopped.

Old people are especially liable to suffer from chronic gastritis dependent upon defective teeth, the excessive use of alcoholic drinks, of tea, tobacco, condiments, improper food, or it is associated with infectious processes, pulmonary catarrhs, or tuberculosis, or with chronic heart or kidney disease. This condition may be so inveterate as to be insusceptible of cure, but may be palliated and kept in check by persistence in rational diet, careful mastication and regulation of the bowels. We may assume that the secretion of gastric juice is diminished, and that the movements of the stomach are weakened, yet under appropriate treatment these functional defects need not be the causes of any discomfort, and the digestion as a whole may be quite sufficient to supply

the nourishment needed by old age. The hindrances to successful management are more likely to come from unwillingness to submit to proper regimen than from the infirmity of the digestive organs. Gastric digestion is, after all, not essential, as has been proved by the total removal of the stomach by Schlatter and others. In Schlatter's case the subject was an *old* woman, so that it cannot be objected that even at an advanced age the intestinal digestion is incapable of fulfilling this function.

If the quantity of food introduced into the stomach at one time is not too large, is finely divided, and is bland, it will pass out of the stomach in a short time without producing any of those disagreeable sensations which are called indigestion. Perhaps the most common of these is flatulent distention, which it is customary to ascribe to fermentation from perverted digestion, but this is comparatively rare. As a general rule, flatulence is caused by air swallowed with the food from improper mastication due to a habit of bolting or to imperfect teeth. The evidence of this is the numerous analyses which have shown the gas to consist mainly of nitrogen, which means atmospheric air, while as a rule the distention occurs so rapidly that there is not time for fermentation to have given rise to the production of carbonic acid gas. I do not deny that fermentation does occasionally take place with the formation of various gases, among others of marsh gas. The matron of a hospital to which I was formerly attached, read me a letter from her father, who was about seventy years of age, in which he told her that he had met with an accident by his breath catching fire as he was lighting his pipe, burning his beard and moustache and the end of his nose. I wrote to the family doctor, who made inquiry,

the result being to confirm the story I had heard, and the case was recorded briefly in the *Lancet;* similar observations have been published by Sir George Beatson and Prof. C. A. Ewald. In these cases it is probable that there is pyloric obstruction with stasis of gastric contents in which there is ample opportunity for fermentation to occur. In his case Ewald proved that the stomach contained marsh gas (CH_4), which rises from the surface of stagnant water caused by the decomposition of vegetable matter, and can be produced artificially by the destructive distillation of organic compounds such as wood or coal; it also occurs normally among the gases of the human intestine from the fermentation of cellulose.

In a note I communicated to the *British Medical Journal* in 1886 (vol. i., p. 421), I stated that in 1865 Prof. Friedreich of Heidelberg published an account of a patient who discharged inflammable gas from the mouth, and that the following analysis of the gas was made by Prof. Carius—

Carbonic acid	26·56
Hydrogen	32·30
Marsh gas	0·34
Oxygen	7·36
Nitrogen	33·44

In 1864 Waldenburg had published a case of dyspepsia with eructations of gases which were readily inflammable and exploded with a visible bluish flame. In 1870 Popoff published an example from the practice of Prof. Botkin of St. Petersburg, and Frerichs had described a similar case from his hospital practice. Schultze published the notes of a case of dilated stomach in which at the *post mortem*

examination on puncture of the stomach a large quantity of gas escaped which burnt with a clear, blue flame about half a foot in length. In a case from the practice of Prof. Frerichs published in the *Irish Hospital Gazette* by Prof. C. A. Ewald, the gas burnt with a brilliant yellow flame, fully a foot long; it consisted principally of nitrogen with carbonic acid, hydrogen, carburetted hydrogen, and oxygen. In a paper by Heynsius, he described the case of a patient who suffered from violent eructation after eating, discharging gas which caught fire when a flame was brought near, as in lighting a cigar; the flame gave little light, but burnt with a distinct though not loud explosive report.

The relief of flatulence is generally afforded by the administration of some substance that stimulates the stomach to contract and thereby to expel the gas upwards or downwards, but all the remedies that are said to be effectual can hardly act in this way. A popular remedy is a charcoal biscuit which is nibbled slowly presumably on the theory that charcoal absorbs gases; but this property is only found in dry charcoal, so that if these biscuits have the alleged action it must be due to some other quality. In my opinion, this is nothing more than the continued mastication, accompanied by the swallowing of saliva which opens the cardia and allows the escape of successive small quantities of gas until the tension is relieved; this explanation is suggested by the equal efficacy of other remedies which have to be diligently chewed and are not swallowed, such as a bit of turkey rhubarb.

The carminative drops (No. 11, Appendix I.) given on sugar will afford relief, but some patients use a " perle " of carbolic acid or creosote after meals

with alleged great benefit, others have infinite faith in "soda mint" tabloids, and one old practitioner assured me that nothing had done him so much good as a pellet of iodide of potassium.

Pain in gastritis generally manifests itself about two hours after food. Hertz has proved that the mucous membrane of the stomach is insensitive, and that pain is not produced in it by the direct action of mechanical or chemical irritants. The pains complained of are of two kinds: (1) burning, and (2) aching. Burning pain is probably produced by the regurgitation of highly acid gastric contents into the lower end of the oesophagus which is sensitive, and aching pain by spasmodic contraction of the pyloric portion of the stomach. The latter may be caused by the irritation of unmasticated portions of food, or from purely nervous causes. The former is relieved by alkalies, especially by magnesia; the latter by small doses, twenty or twenty-five drops of the B.P. Liq. Morphinae Hydrochlor. Hot water is a less dangerous if less powerful remedy for pyloric spasm, but requires to be taken in considerable quantities, a pint or more sipped slowly being effectual and harmless of any after affects of a disagreeable kind, which cannot be said of morphia with many people. Sir Robert Christison was a great advocate for morphia, and was in the habit of extolling its virtues and recommending it to his class for the treatment of many conditions, among others of a common cold in the head. When I was a member of his class some forty years ago I tried it on myself with excellent results, and I am glad to say I have always been able to secure good effects from it on myself, but I soon found out that many people are intolerant of it, even in those small doses which act

well with me, so that apart from the danger of starting the morphia habit its indiscriminate use brings the prescriber as many curses as blessings. It acts badly, as a rule, on the members of gouty families, frequently causing vomiting, headache, and disorder that last a whole day. When Heroin was first introduced it was recommended on the ground that it was free from these ill effects, but I have not found this to be the case, and, unfortunately, I know of nothing that can replace opium or its alkaloids. Chloretone has been praised by some, but I cannot speak of it with confidence, although it is worth trying; it may be given in cachet or tablet, or suspended in mistura amygdalae.

Regurgitation of stomach contents, generally highly acid, indicates great irritability of the stomach which may be relieved by alkalies or hot water, but should be prevented by regulated diet and the use of bismuth mixture (No. 1, Appendix I.) before meals. Water brash is the rising into the mouth of tasteless watery fluid, probably saliva which has never reached the stomach, but is regurgitated from the oesophagus; this also is evidence of irritability, often the result of the abuse of strong alcoholic drinks or of tea.

Vomiting in chronic gastritis occurs, as a rule, some hours after a meal, when the stomach is empty of food, but contains mucus that has accumulated during the fasting period; therefore it is usually in the morning that this vomiting takes place; the retching is violent, but the stomach succeeds in ejecting only a small quantity of mucus. Sipping half a pint of hot water before getting out of bed will prevent this disagreeable incident, but as it is often dependent upon the irritation of the stomach by alcohol taken at bedtime it ceases when the habit

is abandoned, and in any case may be cured by proper regimen and stomach sedatives.

Sufferers from chronic gastritis should abstain from all the articles forbidden in dietary No. 1, Appendix II. At the beginning of treatment a course of minced meat and hot water is often of the greatest service in cleaning the tongue and restoring the tolerance of the stomach for food. This diet consists of twelve ounces of minced lean beef or mutton cooked lightly in a stewpan with a little water, so as to moisten it and enable it to be heated thoroughly ; this quantity should be divided into three or four meals, and should be eaten without any condiment or bread or toast or vegetables ; two hours after each of the meals half a pint of hot water must be sipped slowly. This diet should be taken for two days ; on the third day a thin finger of toast may be permitted with each meal and on subsequent days the meals may be gradually modified, pounded white fish taking the place of meat at one of them, a little potato purée allowed with the meat at another, a plain baked or boiled custard pudding given to follow, the quantity of toast increased, and finally such a diet as No. 1, Appendix I., may be ordered ; this result being attained by stages in six or seven days. Such cases are obviously more readily managed in a hospital, public or private, than in their own homes.

Some cases of chronic gastritis, which do not yield to the above described treatment, cede to counter irritation in the form of a mustard leaf applied to the epigastrium or to the application of a Priessnitz bandage. The latter useful compress is prepared by wringing a towel out of hot or cold water, folding it lengthwise so as to be eight or ten inches wide, wrapping it round the upper part of the abdomen

and covering it with a couple of folds of thick flannel, the whole being fastened with safety pins to prevent it slipping, and left on all night. It is comfortable, promotes sleep, prevents constipation, soothes pain, and allays inflammation; as its name implies we owe it to the founder of hydropathy, and it is not the least useful of the methods of treatment for which we are indebted to him. Priessnitz (1801–51) was a Silesian peasant who was inspired by the notion that natural remedies were best, and sought them in water, air, and sunshine. He looked for no reward, and used no arts of advertisement, but the results of his treatment were so successful that his reputation grew until it reached Vienna, patients from a distance flocked to Graefenburg, the faculty became alarmed for their practice, and complained of him for infringing the law by the illegal exercise of medicine. An inquiry was instituted, but the results were so favourable to Priessnitz that an Imperial decree authorised him to continue his work. That his methods have been abused is undeniable, and that nature-healing as now practised in Germany includes a large element of quackery is unhappily true, but there can be no doubt that Priessnitz was an honest man, and the originator of a method which renders real aid to the art of medicine.

The condition called **plastic linitis** by Brinton, or more accurately by Soupault described as fibrous transformation of the sub-mucous coat, occurs in old age, but is very rare and very chronic, so that it is not often observed. It has been seldom diagnosed during life. The wall of the stomach is thickened to an eight or a quarter of an inch or more. The whole organ is usually reduced in size. Little is known about its true pathology. It is questionable

whether it is a result of chronic gastritis or of lymphatic origin, or is due to the degeneration of tubercle or cancer. If the last it must undergo very rapid fibroid degeneration and spread uniformly all over the stomach.

With modern methods of examination there is a greater prospect of this condition being recognised clinically; but its treatment can only be palliative, consisting mainly in small bland meals administered regularly at short intervals, and the alleviation of symptoms, or the performance of gastroenterostomy.

Brinton who first gave a complete description of this condition is vague about its symptoms; he says there may be an epigastric tumour formed by the hard contracted stomach with a history of its long duration and little else; or there may be periodical attacks of anorexia and local pain with tenderness, vomiting, and fever; while most frequently there are vomiting and haematemesis with other signs of ulceration; he noticed the frequency of general dropsy and the rarity of ascites. Robin says it usually takes the clinical form of chronic gastritis or cancer, and may be complicated by the results of inflammatory adhesions to neighbouring viscera, causing jaundice, ascites, intestinal obstruction and occasionally haematuria. Charles F. Martin speaks of its insidious and ill-defined onset with symptoms of chronic gastritis; pain which is at first insignificant and excited only by taking food, becomes later more constant and dragging in character, while vomiting occurs immediately after meals, as if the contraction of the stomach cavity made it intolerant of food. When the cardia is involved there may be regurgitation of mucus and food. On examination of the abdomen there may be retraction of the epigastrium,

or the presence of a mass moving with respiration; visible peristalsis is occasionally present; palpation discovers a hard sausage-shaped transverse tumour in the epigastrium. Analysis of the gastric contents affords results identical with those of chronic gastritis; where the pylorus is involved there may be stasis.

Although these patients are generally pale, emaciated, and cachectic, Trousseau records a case in which "son teint en effet avait conservé une remarquable fraicheur," his complexion had preserved a remarkable freshness; it is one of the best descriptions of this disease, and the symptoms observed may be summarised thus: Incessant vomiting of food and of glairy mucus mixed with black stuff; no epigastric tumour, but a kind of friction perceptible on palpation when the patient took a deep breath; rapid loss of weight.

Phlegmonous Gastritis may occur in old age, in consequence of the presence of a latent gastric ulcer with chronic gastritis, by which the bactericidal property of the gastric juice is reduced and infection takes place. The wall of the stomach is thickened and infiltrated with pus. The symptoms during life are vague; there may be weakness, headache, loss of appetite, pains in the stomach, distension of the abdomen, and moderate fever (102 F.); vomiting, rigours, and a palpable swelling may be present. It is especially likely to develop in habitual drunkards; sometimes there has been antecedent injury to the stomach as by swallowing a corrosive fluid.

Dilated stomach may be met with under at least three forms. There is first the simple large stomach of the individual who habitually takes a quantity of food, especially common among vegetarian races

whose diet is necessarily bulky; this condition has been called megalo-gastria, to distinguish it from gastrectasia, and there is no question that it cannot be regarded as a pathological condition. The other two forms are primary and secondary gastrectasia; the former being simple dilatation from atony, and the latter secondary to pyloric obstruction, or some obstruction to the discharge of food from the stomach, and in this form it is often incidental to various diseases either of the stomach or of neighbouring viscera.

Brinton pointed out that acute dilatation of the stomach may occur sometimes with fatal results in convalescence from typhoid fever, and appeals to *post mortem* evidence in support of his statement; he described the stomach as so enormously dilated as to occupy the greater part of the belly, and in fatal cases there seems to be complete stasis from paralysis, the muscular wall being stretched to extreme thinness so that the fibres are widely separated.

Some cases were in his opinion clearly traceable to excess of food caused by "the voracity natural to persons convalescent from fevers and similar disorders;" but in others there was no such cause, and he was inclined to attribute the condition to nervous influences. Of the correctness of this view there can now be little doubt; this paralytic dilatation of the stomach is seen in the frog deprived of its brain and spinal cord; but the pathological condition has become familiar in recent years as one of the phenomena of shock after severe surgical operations, especially on the abdomen, and after injuries to the head or spine or blows on the abdomen. Acute strangulation comprising the pylorus or duodenum may also occasion an acute distension of the stomach,

but need not detain us. These acute dilatations have little to do with old age but chronic dilatation has.

Primary or atonic dilatation of the stomach occurs most commonly between the ages of twenty and fifty; of a hundred cases analysed by me only seventeen per cent. were over fifty. This corresponds to its causation as it is mainly dependent upon neurasthenia, a disease which disappears to a great extent after fifty years of age. During the period of its chief prevalence it is three times as common in females as in males (61 to 22), while after fifty the relative proportions are more than reversed (M. 14 to F. 3). The degree of dilatation is great, much larger indeed than is usual in the secondary form. If we distend the stomach with CO_2 by giving in successive doses 120 grains of bicarbonate of soda and 90 grains of tartaric acid dissolved in water, the size of the stomach can be readily determined and the level of the great curvature marked on the abdomen. Of my 100 cases, in 15 the great curvature was somewhere below the umbilicus and above a line drawn across at the level of the anterior superior spines; in 55 it was below that line, but above a line half-way between it and the pubes, while in 30 it was again below that line and reached nearly or actually to the level of the pubes; so that in 85 per cent. the dilatation was marked, and in 30 per cent. extreme. These patients suffer from "dyspepsia," in fact, they constitute the majority of the cases that come under that description; their symptoms are chiefly pain and flatulence; water brash is not uncommon; want of appetite, weakness, headache, and vomiting are relatively rare. Many of these symptoms depend upon associated conditions, for example, the presence of gastritis; a coated tongue is often due to excessive

smoking and probably on this account is more common in men than in women ; the majority of these patients are constipated.

The examination by the stomach tube and test meal shows that there is no stasis, only a little mucus, a few starch granules and epithelial cells being found when the stomach is emptied six hours after a test breakfast. (See Appendix II.)

After one hour the stomach contents show slight changes, *e.g.* there was absence of free hydrochloric acid in 20 out of 57 cases, deficiency in 3 and excess in 2 ; peptic digestion was weak in 17 and absent in 6 ; in all the diastatic digestion was sufficient.

The prognosis of these cases is good so far as life is concerned ; the results of treatment are often very favourable and as time goes on the dilatation diminishes or disappears.

The treatment should be that for neurasthenia, a well-fitting abdominal belt should be worn. Many are improved by tonics such as a mixture of nitro-hydrochloric acid, ten minims, liquor strychninae, five minims with compound infusion of gentian to one ounce ; a vegetable or sulphur laxative should be prescribed when necessary. Saline laxatives should never be given to neurasthenic patients. Where there is gastritis this should be treated, but the treatment must not end when these symptoms are relieved, or a relapse will soon take place. Rest, change of air, tonics, syrupus Formatum Comp. one or two drachms three times a day, or in the more obstinate cases a modified Weir-Mitchell course, with massage and faradism to the abdominal walls, must follow if the treatment is to have any lasting effect.

These cases are not improved by surgical operation. As they are common and constitute a large proportion

of cases of so-called dyspepsia they were experimented upon a good deal in the early enthusiastic period of stomach surgery, but the results were discouraging, and I believe it to be sound teaching that simple atonic dilatation of the stomach is not suitable for treatment by gastroenterostomy.

Secondary dilatation of the stomach depends upon some obstruction to the discharge of stomach contents, either from simple or malignant stenosis of the pylorus, the contraction of the cicatrix of an ulcer in the stomach or duodenum, adhesions to neighbouring parts consecutive to ulcer or inflammation of the gall bladder, or to some previous abdominal operation, or traction on the stomach or duodenum by some displacement, or hernia of the abdominal viscera.

This form of dilatation is less common than that dependent on atony, and much more evenly distributed between the sexes. Of 47 cases 27 were males and 20 females; it is rare before the age of thirty, most common between forty and fifty, but owing to its relation to cancer is met with tolerably frequently in old age. It differs clinically from the atonic form in presenting more marked clinical features. Vomiting is rarely absent from the history, but is often periodical, and the vomited matter consists of food or sour fermenting gastric contents in considerable amount; the vomiting is generally preceded by pain. Coffee grounds vomit points to the obstruction being cancerous; more free bleeding suggests the presence of a simple ulcer. Melaena may be present under either of these conditions. As elsewhere stated, there may be entire absence of stomach symptoms even when the obstruction is malignant; but, on the other hand, there may be the severe constant pain and cachexia of cancer, or a history of ulcer of the stomach.

On examination, by distending the stomach with carbonic acid gas, its size and position may be determined, and the dilatation is seldom extreme, but almost invariably peristaltic movements are visible; these movements are either small, rippling waves passing across the distended stomach from left to right, or a sort of slow bulging which first distends the left side of the stomach, and then sinking on that side distends the other part of the stomach to the right of the middle line. These waves should be looked for with care, the patient lying supine in a good light; the waves occur at intervals of a few minutes, and being of great significance are worth the time expended in their observation. If the stomach has been distended as described so that there is no doubt that the viscus under observation is the stomach, the presence of pyloric obstruction may be regarded as certain, but unless the position of the stomach has been ascertained it is dangerous to draw any conclusion from waves that may be produced in the bowel where they have no diagnostic importance. The other pathognomonic sign is the presence of stasis, that is, the finding of food in the stomach six or more hours after taking a test meal. With a small meal such as we have to use in dealing with stomachs that are not tolerant of food, six hours are enough. The meal may consist of four ounces of finely minced meat freed from skin and fat, with a piece of toast or bread, and about twenty currants, half a pint of hot water may be taken after the meal. If there is no obstruction to the pylorus this meal will have left the stomach in six hours, and nothing will be found but a little mucus. After withdrawing the contents, if any, the stomach may be washed out with a little warm water, and if it is desired to make

a chemical examination an Ewald test breakfast may be given, but is not necessary. Where there is pyloric obstruction whatever the cause, the case is surgical, and the sooner an operation is performed the better. It does not matter whether it is simple or malignant, in either case a gastroenterostomy will give relief, and it is not always possible even for the surgeon, with the growth before him, to say what it is. There is no chemical or other test by which we can by examining the stomach contents say for certain what lesion is present. The results are interesting, and it has been my invariable custom in hospital to have the examination made for the purpose of instructing students, but it may be dispensed with in practice when the positive signs already described are present.

Should the objections to an operation be insuperable, resort must be had to the use of the stomach tube, with which the stomach should be washed out at bedtime as often as may be necessary; perhaps twice a week; warm water being used for the washing.

Although **gastric ulcer** occurs at all ages, it is by no means uncommon in elderly and old persons, although the greater frequency of the disease in females at the early period of life is reversed in their favour as age proceeds. The Registrar-General in his report for 1910 points out that 70 per cent. of all the female deaths from gastric ulcer occur between the ages of fifteen and forty-five, while only 40 per cent. of the male deaths from this cause occur at that period, while at all ages after forty-five the male death-rate exceeds the female and the maximum mortality is between sixty-five and seventy-five.

This analysis of recent figures confirms the opinion

of Brinton, expressed more than fifty years ago, and agrees with general clinical experience.

The same report gives the death-rate per million as for females sixty-three and males thirty-seven.

The most remarkable feature of ulcer of the stomach in old age is its latency; it rarely causes vomiting or pain, but reveals itself by haemorrhage or perforation. Haemorrhage may take the form of haematemesis or melaena, and the form does not depend, as one would like to believe, on which side of the pylorus the ulcer is situated. This very natural assumption has been disproved by stomach surgery, and it must be admitted that it is difficult if not impossible to say from symptoms alone whether an ulcer is in the stomach or duodenum. We have been told that "hunger pain," by which is meant pain that comes on when the stomach is empty and is relieved by taking food, is a positive indication of duodenal ulcer; but this surgical dogma is accepted by few physicians. Hunger pain is present in some cases of ulcer of the stomach as well as in ulcer of the duodenum, and also where there is no ulcer at all.

The ordinary *symptoms* of gastric ulcer are pain coming on some time after taking food, and vomiting; but these are not certain signs on which to base a diagnosis, although for practical purposes they are of the utmost importance, and as it is better to err on the safe side the patient should be put to bed and treated for ulcer.

The *treatment* of ulcer of the stomach is by absolute rest in bed and regulated diet. If there has been haemorrhage no food should be given for twenty-four hours, and if possible the patient should be induced to refrain from swallowing even iced water. Nutrient enemata are not required, and as it has been proved

that they determine a flow of gastric juice but afford a minimum of nourishment, they are better avoided. The popular dread of fasting is unfounded, and should be resisted. After twenty-four hours food in small quantities may be given; for example, one ounce of milk or an egg beaten up with milk every hour for two days; then two ounces gradually increased to four ounces. At the end of a week, provided there is no pain, for the sake of change, cold baked custard or chicken jelly may replace some of these meals; the frequency may be reduced to every two hours. In the third week the meals may be given every four hours, and may consist of minced chicken in panada or cream, bread and butter, boiled or poached egg, vegetable purées. In the fourth week the diet may be fish, chicken, or mutton, vegetable purées, stewed fruit, bread and butter, weak tea or coffee with milk and cream, eggs boiled or poached with water or soda water. At the end of the fourth week the patient may get up, but all food must be soft, easily digestible and bland. These precautions should be maintained for many months, as the frequent relapses that follow are due to their neglect. If during the course of treatment pain or other symptoms should return, the patient must be put back to the diet which produced no discomfort; for this reason the stages should not be too hurried; two days being generally allowed before another step is taken, and the patient should not be allowed to get up until able to take a fairly normal diet without pain or discomfort, for if these are experienced in bed they are sure to be aggravated on getting up. But it is quite rare to meet with any difficulty of this kind; this method has stood the test of long experience, and can be trusted to give good results.

There is no drug treatment that is of serious value for the healing of the ulcer. Olive oil and atropin are recommended on the ground that they diminish the secretion of gastric juice, and they do no harm; but the only necessary drugs are iron if there is anaemia, and sulphate of magnesia if the bowels are confined. These indications are fulfilled by the mistura magnesia sulphatis cum ferro. (See Appendix I., No. 7.)

Surgical assistance should be sought where there is recurrent haemorrhage, where the pain is persistent, where vomiting continues in spite of rest and careful diet, or where the ulcer causes obstruction from pyloric spasm or cicatricial stenosis or adhesions. It is rather the fashion to ignore the need for precise diagnosis and to invite surgical intervention in all obstinate cases, but this can only mean the performance of a certain number of unnecessary operations, that might have been avoided.

Old age itself is no bar to surgery when the indications are clear, but the presence of extreme debility or grave cardiac vascular or renal complications may forbid an operation.

The symptoms of **cancer of the stomach** are variable, so that while it is often one of the easiest diseases to diagnose, other cases are recognised only *post mortem*.

A patient was admitted under my care for supposed pernicious anaemia, and on account of the gastric relations of this condition I asked that the examination of the case should include a thorough investigation of the stomach functions. This revealed marked stasis, and at the operation a cancerous stenosis of the pylorus was discovered, which had already made such progress as to be inoperable, yet no stomach

complaint had been made, and no subjective symptoms pointing directly to this organ were present. In another case the stomach was examined carefully by all then known means, which did not, however, include radiography, but did include the repeated use of the stomach tube, the findings pointing to chronic gastritis until the occurrence of a copious and fatal haemorrhage, when a large fungating cancerous mass was found growing from the greater curvature about midway between the cardia and the pylorus. In this case the disproportionate loss of flesh and strength had suggested the probability of cancer. In spite of the diligence with which it has been sought for, a trustworthy sign of early cancer has so far eluded our quest, and in the absence of a palpable tumour the diagnosis rests not on certainties but on probabilities. This is not altogether a disadvantage as it leaves a ray of hope, although if it were possible to recognise the disease at the beginning the prospect of successful surgical intervention would be greatly improved. At present all we can do is to follow the indications for surgical intervention in stomach diseases laid down on p. 144.

How far should age be regarded as in itself a contra-indication to surgical intervention? The answer in my opinion is, apart from cancer, Not at all! Except in cancer stomach surgery is not attended by a high mortality, while it offers a prospect of cure of which elderly patients should not be deprived. I saw quite recently a man of sixty-eight in such excellent health that I passed him for insurance as a first-class life, yet a year ago he had undergone an operation for a duodenal ulcer which had given rise to recurrent and severe haemorrhage. In cancer the risk is so great that hesitation is

permissible and the answer is more doubtful; our decision must depend upon the patient's general condition of strength and the absence of cachexia; unfortunately, wherever the diagnosis is plain the case has probably passed beyond the limits of successful surgery, so that an exploratory incision is hardly justifiable in any case, and in an old person is so likely to be followed by immediately fatal results that it is not advisable.

Indications for operative interference in diseases of the Oesophagus, Stomach and Duodenum :—

1. Impermeable stricture of the oesophagus.
2. Pressure and traction diverticula.
3. Impaction of foreign bodies.
4. Perforated gastric ulcer.
5. Subphrenic abscess.
6. Foreign bodies in the stomach.
7. Pyloric tumour with symptoms of pyloric obstruction.
8. Persistent or recurrent haemorrhage from a gastric or duodenal ulcer.
9. Persistent and intense pain.
10. Persistent vomiting not relieved by medical treatment.
11. Stasis of food in the stomach six hours after an Ewald test breakfast, proving the existence of pyloric stenosis.
12. Hour glass stomach when it causes obstruction and stasis.
13. Cancer when discovered early. If stasis is systematically looked for early cases of cancer will from time to time be discovered.
14. Tetany.

Hyperchlorhydria.—It is doubtful whether there

exists such a condition as a true increased acidity of the gastric juice. It is certain that the stomach contents, when withdrawn for examination, may show a much higher acidity than the normal two per mille, but as the stomach empties itself the quantity of hydrochloric acid secreted may easily increase the acidity of the retained residue, and the smaller the amount of this residue the more fallacious is the result of the examination. Those who have had most experience in the use of test meals are least disposed to attach diagnostic importance to the determination of the percentage of hydrochloric acid present in them. Perfectly healthy persons often show the greatest variations to this method of testing the amount of free hydrochloric acid, ranging from *nil* to three or four per mille, while the symptoms that are attributed to hyperchlorhydria have been shown to be due in many cases to other conditions.

On the other hand, there is undoubtedly a condition in which there is excessive secretion of gastric juice, such patients often vomiting half a pint or more of sour mucus containing pepsin and hydrochloric acid. This disease is a neurosis, the hypersecretion occurs as the result of nervous excitement, and the state in which it is likely to occur is brought on by overwork or other causes of nervous exhaustion. It is not a disease of old age, but like other neuroses it tends to disappear after middle life, so that there is no justification for discussing it at greater length in this place.

In old age, especially where bodily and mental activity are well preserved, there is often some indifference to food, hunger is seldom felt, simple food in moderate quantity is preferred, and " the pleasures of the table " are no longer of interest, but these

old people eat sufficient for their needs. Actual **loss of appetite** either points to some toxic influence, such as the immoderate use of tobacco, tea, or alcohol, or to the presence of organic disease. Change of air and the use of infusion of quassia in two-ounce doses three times a day will often stimulate failing appetite.

Excessive appetite is more often met with in association with loss of mental power. **Bulimia** is the name given to abnormal hunger, which is rare, and **akoria** to the absence of any feeling of satiety, which is not seldom a symptom of the gouty constitution. The latter is easily checked, as no discomfort is experienced from limiting the quantity of food to reasonable quantities; but hunger is a terrible sensation that takes no denial; it is sometimes connected with the presence of tape worm, or with diabetes, Graves' disease, cerebral tumour, or insanity; it may be allayed by the use of opium, Indian hemp, bromide of potassium, or tobacco; tea and other drinks, even alcohol, should be allowed between meals, but some cases are rebellious to all remedies.

Gastralgia or **pain in the stomach** in old people is often dependent upon latent organic disease, ulcer or cancer, or chronic gastritis. The true neurotic form, like other functional neuroses, is less common in advanced age. Its origin may be still open to doubt, but the most probable explanation is that of pyloric spasm, and the most effectual remedy is a small dose of morphia, which may be given in a mixture with hydrocyanic acid. Chloral or chloretone may be tried where morphia disagrees. Tea usually increases the pain and is better avoided; fatigue is a potent factor in its causation; tobacco may cause it; alcohol will often relieve it at once, and in old

age is not such a dangerous remedy as in earlier life.

Giddiness or **vertigo**, which is made worse by lying down, is generally due to stomach causes; this may be simply over-loading the organ or may be dependent upon sub-acute gastritis and call for the appropriate treatment for that condition. "Nightmare" is an attack of gastric vertigo coming on during sleep.

Agarophobia and **Claustrophobia**, or the giddiness felt in open spaces in crowds or in closed places, are associated with digestive derangements, errors of diet and neurasthenic conditions. They are not met with so often in the old as in the young and middle aged.

CHAPTER VII

Diseases of the Digestive System—*continued*

Intestinal Colic—Constipation—Appendicitis—Cancer of the Bowel — Hernia — Obstruction — Haemorrhoids — Peritoneum—Hepatoptosis—Gall-stones—Cirrhosis—Cancer of the Liver—Pancreatitis—Cancer of the Pancreas.

Intestinal Colic

Colic or **spasm of the colon** is one of the commonest troubles of old people, particularly old women, and is usually dependent upon the use of articles of diet containing cellulose, weakness of the wall of the bowel and of the abdominal muscles and constipation. The last by prolonging the stay of the food residue in the colon affords an opportunity for fermentation of cellulose and the production of various gases.

Cellulose is present in the fibrous framework of all vegetables and fruits, especially in stalks, leaves, and coverings; it is a useful element in diet, as it gives bulk and promotes peristalsis, but where the dynamic force of the intestine is enfeebled by sedentary habits, and fatty infiltration of its muscular coat, the stimulus fails and the effect is harmful, and such food must be forbidden. (See Appendix IV., Table 5.)

If possible, regular exercise should be taken, or where this is impracticable, abdominal massage and mild faradism should be tried. A course of treatment at a Zander Institute should be recommended; there are small installations in London and Bath,

and splendidly equipped establishments abroad, in Paris, Vichy, Carlsbad, and elsewhere. The bowels should be regulated, for which purpose nothing acts better than a freshly-made infusion of senna pods taken every night at bedtime. Ten or twelve pods should be put into a bedroom tumblerful of water and left to stand all day; the infusion should be poured off from the pods when it is required for use. It is not unpleasant to take, and its action is both certain and mild, senna operating upon the whole length of the large intestine. If there should be any faecal accumulation in the rectum an enema of half a pint of warm olive oil should be given, the oil being run in slowly from an irrigation tin and given time to act thoroughly, a folded towel being pressed against the anus so as to prevent the oil from escaping until the bowel is ready to act.

Constipation

Constipation is so common in the aged as to be rather the rule than otherwise, and although there are instances in which no harm seems to result from infrequent evacuation of the bowel, in most persons there is discomfort or actual disorder. Headache, languor, indigestion, flatulence, colicky pains, piles, and anal fissure may result; while straining may bring on even more serious consequences where so many structures are weakened, even fatal cerebral haemorrhage having occurred at stool under these circumstances.

Much may be done to regulate the bowels by diet, which should be so arranged as to exclude what is likely to constipate and include those things that promote peristalsis.

Constipated persons should use cream in the place of undiluted milk, China tea or tannin-free tea rather than the teas of India and Ceylon, white wine instead of ordinary red wine that has not deposited its crust, and should drink soft instead of hard water. They should avoid medicines containing opium or its alkaloids, tannin, iron, magnesia, or chalk. Many patients have increased their constipation by taking Gregory's powder, the prolonged use of which may lead to faecal impaction by the collection of the magnesia into a mortar-like mass in the rectum, requiring to be broken up mechanically before it can be got away.

For the promotion of regularity the first requisite is a punctual effort at a fixed time daily, with due allowance of time and attention to produce the desired result. Regular walking exercise should be taken daily in all weathers if health permits.

The diet should include, if possible, plenty of fat in the form of butter, oil, cream, and fat bacon; oatmeal porridge may be eaten with cream or sour milk before or at breakfast; an apple, pear, or a few plums after breakfast; stewed fruit at luncheon and dinner; vegetables with butter or oil; salads with oil if they can be digested; cooked green vegetables; brown bread. Many of these articles are difficult to digest, and where the bowel is weak are liable to cause flatulence, especially when its evacuation does not occur with regularity, so that vegetables and fruit containing much cellulose (see Table 5, Appendix IV.) should be given with caution or their use postponed until constipation has been overcome by other means.

The use of sour milk is sometimes of the greatest help in obstinate constipation. A pint should be

taken daily, and may be eaten with porridge, rice, or hominy, or by itself, sweetened with sugar, jam, or jelly. It is easily prepared in a thermos flask, and to-morrow's supply can be started by adding to the warm milk (100° F.), a tablespoonful of the whey from that which has been prepared for to-day, so that there is no need to use fresh tablets (I use " Lactobacilline " tablets) on each occasion when it is being prepared daily. To start the fermentation six or eight tablets are necessary, and about twenty-four hours are needed to effect the change properly. If, however, the milk becomes too sour, a shorter time may be allowed. As an illustration of what it can do, I may mention the case of a young man who was brought to me by his father-in-law, a medical practitioner, on account of obstinate constipation, for which he was taking twelve grains (!) of compound colocynth pill every night. If he failed to get a movement of the bowel he suffered from intense headache, which incapacitated him from following his occupation. I persuaded him with difficulty to try sour milk, and to reduce gradually the quantity of pill. About a year elapsed without my hearing any more about the case, when his father-in-law stopped me in the street to say that the patient was much better, that he had reduced the nightly pill to two and a half grains, but that he would ask him to call and report to me ; this he did, confirming his improvement and adding that his headaches had quite left him.

In the case of persons who are confined to the house some form of exercise which promotes the use of the abdominal muscles should be attempted or abdominal massage or kneading practised ; in many instances the patient can learn to do this for himself, but it must be carried out regularly.

If in spite of all these methods the bowels are still obstinate, a teaspoonful of regulin may be given three times a day with meals. Regulin is agar-agar jelly dried and broken up small, to which a certain amount of cascara has been added. It is almost tasteless and very effective. Other useful remedies are the infusion of senna pods already described; cascara evacuant (Parke, Davis & Co.) taken at bedtime or three times a day after meals; one or two teaspoonfuls of equal parts of castor oil and glycerine rubbed up together, which was the most effective of all remedies in the case of an old medical friend who was for several years under my care; compound liquorice powder; syrup of senna pods; Rochelle salt, sulphate of soda, phosphate of soda, sulphate and chloride of magnesia plain or effervescent taken in hot or cold water the first thing in the morning; finally, the various aperient mineral waters of which Rubinat is perhaps the most effective. Where there is great weakness and even mild laxatives cause pain, glycerine in capsule or enema or enemata of warm olive oil should be tried. The Priessnitz bandage must not be forgotten; it has been already described, but shortly it consists of a towel folded lengthwise, wrung out of cold water, and wrapped round the abdomen; it should be covered with a piece of thick flannel and be worn all night.

Appendicitis

Inflammation of the appendix is not by any means a disease of old age, most cases occurring in youth or middle age, but quite 12 per cent. of all cases occur in persons over fifty-five, so that in proportion to the numbers living at that age it is not uncommon.

It occurs more often in men than in women in about the proportion of three to two. According to the Registrar-General's report the disease is increasing in England and Wales; in 1901 there were thirty-eight cases per million living, and in 1910 the figure had risen to sixty-six, but it is not possible to say how much of this apparent increase may be due to the use of more accurate terminology. Its causes are obscure, but it probably originates in localised catarrhal inflammation which spreads from the caecum into the appendix. Foreign bodies are rare, but faecal concretions are common, although their relationship to the disease is uncertain. The canal of the appendix is often stenosed from chronic inflammation, and the concretions lie behind the constriction as if formed by the absorption of liquid from faeces that had entered the cavity when the passage was patent. Such faeces would contain plenty of the bacillus coli, and this ordinarily harmless organism may become virulent. So long as the inflammation is confined within the appendix, it does little harm, but the infection spreads to the connective tissue outside. If the infection is pyogenic, and especially if ulceration has taken place, the appendix may become perforated and a foul septic abscess form around it, or perforation take place into the peritoneal cavity, the bladder, or more fortunately into the bowel or the vagina. The complications that may take place are varied and numerous; thrombosis of the iliac or portal veins, pylephlebitis, abscess of the liver, suppuration of the retroperitoneal connective tissue, or of the mesenteric glands, or ulcerative perforation of arteries.

The *symptoms* of an ordinary attack of appendicitis are generally ushered in by pain which may be

sudden and intense, accompanied frequently by nausea and vomiting; there is tenderness localised in the right iliac fossa, with muscular rigidity in the same area. The seat of maximum tenderness is at McBurney's point, situated midway in a line drawn from the umbilicus to the right anterior superior spine. The pain may sometimes come on in paroxysms, the so-called appendicular colic, and be agonising in character. There is generally fever, the temperature rising to 102° F., but in very severe cases in children it may reach 104° F. When suppuration has occurred leucocytosis is present. The abdomen is at first normal in appearance, but gradually becomes distended from general tympanitis. A tumour, or an ill-defined induration, may be palpable above Pouparts' ligament; the patient is most comfortable on his back, with his right leg drawn up; rectal examination may reveal nothing, but if the appendix hangs over the brim of the pelvis it may be possible to feel an abscess or a tender swelling; micturition may be painful, or there may be tenesmus or retention.

The usual course of first attacks is towards recovery, but in not a few an indolent swelling remains, and so long as this can be felt the patient's condition is not safe. Occasionally, more especially in children, the course of the case is explosive, and unless promptly dealt with by operation proves fatal in three or four days; in these there is rapid necrosis of the tip of the appendix, permitting the escape of its contents, and infection of the peritoneum should it burst into that cavity.

Other cases are recurrent or relapsing; they follow a mild course, yield readily to treatment, but return after a few weeks or months with a renewal of all their symptoms. Before treatment by

operation was well established such cases were fairly common, but are now seldom seen, as after one relapse it is usual to operate when the attack has subsided.

The *diagnosis* is generally easy, but confusion has arisen with enteric fever, biliary and renal colic, cholecystitis, neuralgia of the anterior crural nerve, mucous colitis, and duodenal or gastric ulcer. Many of these mistakes have been made from undue haste to operate, and have been recognised on the operating table.

The *prognosis* of first attacks is good if we exclude those fulminating or explosive cases already mentioned, but although they recover a considerable proportion recur; how many we cannot say. It is generally held in this country that an operation should not be performed in the absence of any urgent symptoms before the second attack, and not until that has subsided, but if a first attack does not clear up completely, or leaves an indurated lump in the groin, operation should not be postponed; operation is the only proper treatment in all cases where there is suppuration, as shown by the presence of leucocytosis.

In an ordinary first case we may apply hot fomentations, poultice, or ice-bag, and give a dose of calomel or sulphate of magnesia every hour until the bowels are well open. Five grains of calomel every hour is a safe and sure remedy in cases suitable for medical treatment. The diet for the first twenty-four hours should be beef-tea or bouillon, with nothing solid; after the first day simple food may be allowed in small meals four times in a day. Pounded or creamed chicken or fish, vegetable purées, custard pudding, milk roll and butter, cocoa or weak China tea with

cream. Milk should be taken only in small quantities, if at all. The bowels must be kept open by the use of a laxative if required, for which there is nothing better than the infusion of senna pods. After recovery the patient should avoid rough food, such as porridge, brown bread, salads, uncooked fruit, and raw vegetables, nuts, pickles, and putrid game. Constipation must be prevented, and violent exercise avoided for the next few months. If objections are raised to these restrictions the appendix should be removed.

In an acute attack it is better to avoid using opium or its alkaloids until the diagnosis is clear, as it masks the condition and may prevent the recognition of urgent symptoms.

Cancer of the Bowel

Cancer or malignant disease of the bowel, especially of the rectum, is a common and insidious mode of death in old people.

Its symptoms often are at first merely a growing sense of weakness and loss of flesh. When the growth is seated in the colon nothing else may occur until there is obstruction, leading perhaps to the discovery of a palpable tumour. In the rectum, on the other hand, there is diarrhœa, or what the patient calls diarrhœa, although the dejecta are for the most part mucus and blood. This frequent desire to go to stool in an elderly man is significant, and if accompanied by the passage of blood and mucus almost diagnostic, but a rectal examination clears up any doubt. Other symptoms are enlarged inguinal glands, bladder tenesmus, and pigmentation of the skin.

Cancer may be preceded and perhaps caused by

the irritation of chronic constipation, by simple adenomata or by tubercular syphilitic or dysenteric ulceration the scars of which undergo degeneration. It has been attributed, but with how much truth is doubtful, to depressing emotions, improper food, and the abuse of drastic purgatives.

Its treatment can be only palliative. Colotomy may prolong life by relieving obstruction; excision of a rectal growth is at times possible; opium or its alkaloids may be necessary to allay pain and lessen the distressing frequency of the desire to defaecate, but its use is often attended by increased inability to take food, and general discomfort, so that it is not altogether a satisfactory remedy. Radium appears to be turning out no more effectual than any other of the specifics upon which hopes have been built that a cure for cancer had been discovered.

The duration of the disease varies from a few months to five, six, or even ten years, but the average is two years, cancer of the rectum being more rapid in its course as a rule than cancer of the colon.

About 70 per cent. of the cases occur after the age of forty-five, the numbers more than doubling in the next decade; thus from forty-five to fifty-five the number per million living is for males 261·4, for females 261·5, but from fifty-five to sixty-five it is for males 727·2, for females 637·4, and the figures continue to increase in about the same proportion at the higher ages. While on the whole the higher death-rate of females from cancer is maintained, the excess of the female death-rate per million is so slight as to be hardly worth mentioning (140 per million males to 141 per million females), but in the case of cancer of the rectum there is clear evidence of its greater prevalence in the male, the Registrar-General's figures being for all

ages 78·4 per million males against 61·3 per million females. In both sexes there is the same marked and continuous rise after forty-five, and in the subsequent decades, while in females cancer of the uterus shows its highest mortality from forty-five to fifty-five, deaths from cancer of the rectum are greatest in the next two succeeding decades, but calculated on the total number living at those ages the rise of the curve is even more striking. Cancer of the rectum is, from these figures, clearly a disease of old age affecting both sexes, but with a greater incidence on the male than the female. This would seem to imply that it does not often originate from cancer in neighbouring organs, or it would show a greater tendency to run parallel with the figures of cancer of the uterus, but although most often primary it is at times secondary to cancerous growths in the breast, uterus, bladder, or prostate.

Hernia

Hernias are peculiarly liable to take place as age advances, inguinal in men, femoral in women, umbilical in both sexes. Of these by far the most common is the inguinal hernia on account of the existence of the canal, which is closed only by the tonus of the tendons fasciae and ligaments by which it is surrounded. As these become lax in old age, any violent exertion may force a loop of bowel into the opening which is gradually dilated until the ring is passed and the bowel falls into the scrotum. Such a hernia is generally reducible, and may be kept inside the abdomen by wearing a suitable apparatus; but where any impediment exists to the return of the hernia it is called irreducible, and if rest, restricted

diet, and careful taxis fail to overcome the obstruction, a Kingdon's truss, or some such apparatus protecting the hernial protrusion by a hollow cup or bag, must be worn day and night to prevent further descent of the bowel. The propriety of an operation should be considered, as this is the only means by which the patient can be relieved from the state of discomfort and even of danger in which he is placed, for there is always the risk of strangulation, necessitating the performance of an immediate operation with all its disadvantages. Further, an unreduced hernia may become obstructed by faeces or become the seat of local peritonitis from external injury. For all these reasons, unless the presence of grave organic disease of the heart, lungs, or kidneys forbids such interference, it is better to have the hernia reduced by an operation, which will at the same time be able to close the opening and prevent further descent. The position of the operation for the "radical cure" of hernia is essentially different from what it used to be; then the operation gave only temporary relief and almost invariably ended in relapse; now the closure is solid, and a permanent result may be confidently assured. Even a reducible hernia is a nuisance, a cause of discomfort and of possible danger, so that under the altered prospect of securing, at little risk, complete immunity from further trouble it is much better to have the operation performed at some suitable time before the parts concerned have got stretched and distorted.

Obstruction of Bowel

A simple **obstruction of the bowel** may occur from gall-stones getting impacted in the ileo-caecal valve,

from the presence of foreign bodies or from spasm. Paralytic ileus is more common in old age, occurring as the consequence of constipation. Intussusception may occur. Twists (volvulus) are occasionally met with. Obstruction due to bands and adhesions and internal hernias through abnormal apertures or rings formed by bands or adhesions are among the accidents which occasionally happen, while the formation of hernias through the umbilicus or the inguinal canal and the femoral ring are peculiarly liable to occur in old age, and if neglected they may get impacted or strangulated, and may become the source of serious or fatal complications.

Haemorrhoids

Haemorrhoids and prolapse may be taken together as they are often confounded at least by the laity, with whom " piles " is a term that is more frequently correctly defined as prolapse than as haemorrhoids. True haemorrhoids cannot be cured by a laxative and a little astringent ointment. At St. Mark's Hospital in the City Road there used to be scores of cases of piles attending daily, and the reasonably successful treatment was the mistura magnesiae sulphatis cum ferro with calomel ointment, forty grains to the ounce, the basis being stiffened with cacao butter. This method gives better results than the ointment of gallic acid and opium, but must not be expected to remove hypertrophied masses of mucous membrane or vascular growths; for these surgical aid must be sought.

Peritoneum

The **peritoneum** is liable to suffer in old age from inflammation (peritonitis), tubercle, and cancer, but

only the last has any peculiar relation to the period of life or requires specific description.

Cancer of the peritoneum is always secondary to growths usually in some viscus of the abdomen or pelvis, but occasionally more remote, but sarcoma and endothelioma may be primary. The symptoms in any case are obscure; there may be loss of weight or loss of strength, with pain effusion into the abdominal cavity and a tumour or several tumours discoverable on palpation. The only treatment worth consideration is surgical, but that offers little prospect of a radical cure, although primary endotheliomata are usually encapsuled and may be enucleated if encountered early.

The Liver and Pancreas

Hepatoptosis.—From stretching of the suspensory ligaments the liver in old age tends to drop downwards and to the left. The entire organ is pale, yellowish rather than dark brown in colour, and often reduced in volume, the loss of weight varying from six ounces to a pound or more. Its surface is sometimes granular; its density greater; its resistance to the knife on section is increased, while under the microscope the rows of hepatic cells are found to be atrophied and replaced by connective tissue with widening of the portal fissures and spaces, but the fibrosis does not tend to enter the lobules. Many of the vessels are obliterated, and Glisson's capsule is thickened, while dilated tortuous vessels may be seen ramifying in it.

The **gall bladder** frequently contains calculi; its walls may be thickened, encrusted with lime salts or adherent to neighbouring parts. It is occasionally

dilated, distended with bile or mucus and its walls thinned.

Murchison stated the tendency to form **gall-stones** increased with age, but this was not the case with the liability to biliary colic. Schroeder found gall-stones most frequent on the *post mortem* table as age advanced, and gave the following table, and Naunyn accepted his conclusions.

Age of patients.	No. of P.Ms.	No. of cases with gall-stones.	Percentage of cases examined in which gall-stones were present.
0–20	82	2	2·4
21–30	188	6	3·2
31–40	209	24	11·5
41–50	252	28	11·1
51–60	161	16	9·9
60 and over	258	65	15·2

Brockbank's Manchester findings are also worth quoting:—

Age.	No. of P.Ms.	Cases in which gall. stones were found.	Percentage.
0–20	67	2	2·9
21–30	112	6	5·3
31–40	180	6	3·3
41–50	189	14	7·4
51–60	128	12	9·3
61 and over	66	9	13·6

Grube and Graff give the following analysis of 940 cases observed at Neuenahr from 1895 to 1911, in which the percentages show the proportion of cases of undoubted gall-stones at different ages.

Age.	Percentage of gall-stones.
0–20	1·0
21–30	12·7
31–40	27·3
41–50	28·7
51–60	19·7
61–70	8·2
71–80	2·0

This seems to bear out Murchison's remark, as at a health resort like Neuenahr there would be only clinical observation and no *post mortem* material on which to rely.

All authorities agree as to their greater prevalence in the female sex, Schroeder's statistics showing the proportion to be 1 male to 4·6 females, and the authors just cited give almost the same relative incidence, viz. 1 male to 4·3 females; in the same period of time over fifty years of age there were 49 males as against 214 females or a proportion of 1 to 4·36.

The influence of child-bearing is often alleged; out of a total of 762 female patients 613 were married and had had children; 44 were married, but childless, and 107 were unmarried; but as the proportion of unmarried but marriageable to married women is about 1 to 10, these figures are not so significant as at first sight they appear, nor is there any explanation why the married but childless patients should be only 44 unless this low figure corresponds to the comparative infrequency of the sterile married woman.

Constipation plays an important part in both sexes, probably because it is so often associated with an inactive life, and in this inactivity we have the most reasonable explanation of the prevalence of the disease. This is assisted by anything which assists in causing obstruction to the flow of bile, tight waistbands being one of the most obvious; to which should be added any of the causes which may lead to splanchnoptosis.

The part played by infectious processes in the etiology of this condition is not so great as was formerly supposed, as Aschoff and Bacmeister have proved that the presence of bacteria is not essential

to gall-stone formation, and Riedel has published a case in which he removed a solitary stone from a completely sterile gall bladder. Both conditions are common, and their coincidence is inevitable, while it is almost impossible to decide which had priority; but infection of the gall bladder, especially after enteric fever, is of importance on account of its liability to set up attacks of cholecystitis and to convert a quiescent and innocent cholelithiasis into a serious and painful disease.

There are many conditions which are described as causes, but would be more correctly regarded as associated; they may depend upon the same condition, such as obesity, diabetes, nephritis, arteriosclerosis, or gastro-intestinal disorder where inactivity of the body, coupled with excesses in eating and drinking, should be impeached as the **fontes et origines malorum.**

The prophylactic treatment of gall-stones must take into account those removable conditions which have been enumerated in considering their causation, and so far as possible these should be eliminated or minimised. For example, we can teach the harmfulness of suspending heavy clothing from tight waistbands, of constipation, of excesses in eating and drinking, and we should order a course of urotropine for three or four weeks during convalescence from enteric fever in order to kill the bacilli of Eberth; a dose of ten or fifteen grains should be given every night at bedtime dissolved in half a tumbler of hot water.

Attacks of **biliary colic** are not always caused by the passage of a stone along the cystic duct; but perhaps more often by cholecystitis or inflammation of the gall bladder. Tenderness, and sometimes a pear-shaped tumour to be felt below the costal margin

at the outer edge of the right rectus muscle with absence of jaundice point to this condition and indicate rest in bed, hot fomentations locally, a full dose (three to five grains) of calomel and liquid diet, beef-tea, milk and water, oatmeal gruel, with plenty of hot water to drink. It was in these cases that calomel earned its reputation, which has been compromised by its being mistakenly ordered where the cause is a stone, as was the case with Sir Walter Scott; in the latter class of case the calomel does harm by exciting peristalsis in the bile passages and bringing on attacks of pain, where our object should be to soothe and restore quiescent conditions in which the stones are harmless denizens of the gall bladder. Those who are liable to attacks of biliary colic should avoid strong purgatives and keep the bowels regular by diet, the use of fruit, porridge, and brown bread, supplemented, if necessary, by daily small doses of some laxative, such as a teaspoonful of sulphate or phosphate of soda every morning in half a pint of hot water.

When the attacks of colic recur frequently, or if there is persistent jaundice, the propriety of an operation must be considered, as in some cases it is the only means of cure. In view of the liability of recurrence, the most satisfactory operation is removal of the gall bladder together with its contents. If there is a stone impacted in the common duct, it must be removed by incision and the duct sewn up again. This seems preferable to Lawson Tait's crushing *in situ*, as the stones are soft but not friable, and the wall of the duct may be seriously injured in the attempt to get the stone broken up and passed down the canal. The technique of the operation is a subject for which the reader is referred to surgical text-books.

Attacks of colic may stop without rhyme or reason, so that the value of our treatment is always open to doubt. A lady had had repeated attacks which had kept her a permanent invalid for eight or nine months when I saw her; I advised an operation, to which she objected, but at last I got her to promise that if she had another attack she would submit. I followed her subsequent history for some years, and I know that she had no more trouble with her liver.

Cirrhosis of the liver may result from many causes, but is most commonly the result of alcoholic excess. It may run an entirely latent course, as happened in the case of an engineer at a colliery who died suddenly many years ago. I was asked to make a *post mortem* examination, when I found the stomach distended with blood and the liver in a most advanced state of atrophic cirrhosis; there was no trace of ascites. The man was known to be one of those hard drinkers who take all their alcohol after working hours, and the books of the colliery showed that he had not been absent from work for a single day during the previous two years. The symptoms generally described are due to the associated gastritis, which, like the liver disease, is caused by the abuse of alcohol. The only symptoms which are properly assignable to the state of the liver are ascites and haematemesis, but neither may be present even when the disease has reached an advanced stage. Both depend upon the obstruction in the portal canals by the interstitial hepatitis, but are to some extent mutually exclusive, for if the collateral circulation through the subdiaphragmatic coronary and other veins has developed sufficiently to carry the portal blood to the right sides of the heart there may be no ascites, yet these enlarged veins, especially those in the oesophagus, are the

chief sources of haemorrhage when this occurs. The spleen is always enlarged, but may not be easily felt when the abdomen is distended with fluid or may shrink after severe haematemesis. Jaundice may be caused by extension of the catarrhal inflammation from the stomach to the duodenum and bile ducts, or in the last stages may depend upon parenchymatous hepatitis or yellow atrophy of the liver, which sometimes supervenes as a terminal phenomenon.

Ascites may not only be absent throughout, but it may disappear under treatment. It depends upon the loss of balance between the two processes by which the portal circulation is, on the one hand, being obstructed, and, on the other, being drawn into new channels. This balance may be suddenly upset by an attack of congestion of the liver, the result of an unusual debauch or a blow on the abdomen, or may be restored by time effecting an enlargement of the supplementary veins. The latter process is aided by tapping the abdomen or more effectively by Morison's operation of omentopexy, but this operation is too dangerous to be recommended, nor can I approve of the continuous drainage which some surgeons have employed. I have had several cases in which after repeated tappings the ascites has not recurred, and it is probable that had I been able to follow all my cases I should have a larger number of successes to relate. One was tapped four times in five years, and after that had no return; I showed him at the annual meeting of the British Medical Association at Birmingham in 1890 and to my class for several years, when I lost sight of him; another was tapped twice and lived comfortably for three years, when he died by accidental poisoning with oxalic acid; a third, a gentleman's servant, was

tapped five times between June and October in 1901, but was lost sight of until 1905, when I heard that he had kept well, and he wrote me a letter in which he said, "I take no stimulants whatever. . . . I have never had the slightest return. . . . I feel as strong as ever I did, which you will believe when I tell you that I have carried sixteen stone up and downstairs every night and morning with the help of the footman."

When haemorrhage occurs absolute rest and an ice-bag to the epigastrium with total abstinence from food for twenty-four hours are about all we can do, as our success depends upon the size of the vessel that has given way and the extent of the rupture.

In cases of cirrhosis where the conditions are less urgent great improvement follows total abstinence from alcohol. If there is gastritis the appropriate treatment for that condition must be employed. In others a mixture of dilute nitrohydrochloric acid, ten minims, Succus Taraxaci a drachm, and water to one ounce three times a day after food, with, if necessary, a saline laxative, one or two teaspoonsful of phosphate or sulphate of soda or Rochelle salt dissolved in hot water, to be taken every morning, should be prescribed.

Cancer of the liver may be primary or secondary; it may begin in the gall bladder or bile ducts, or in the substance of the gland, and in many cases it is associated with gall-stones, so that there is good ground for the opinion very generally entertained that the presence of calculi acts as an irritant which may determine the growth of cancer.

When the bile ducts are involved the occurrence of jaundice draws attention to the disease, but the diagnosis may not be easy, especially in those cases

that have previously suffered from gall-stones, although the rapid loss of flesh is significant. This was impressed upon my mind many years ago by the case of a woman who had a distinct history of gall-stones, but, I was told, had been discharged from another hospital as cancer; I felt sure about the gall-stones, and doubted the cancer, so asked a surgical colleague to operate; he opened the gall bladder and removed over a hundred stones, but there was cancer of the bile ducts as well, and then I learnt that the patient had been very fat and had lost six stones in weight in a few months, facts I might have ascertained before if I had not been in such a hurry, but my excuse was that cholecystotomy was a new and successful operation which I was keen to have done. The patient recovered from the operation, so no harm was done, but the man at the other hospital was right and I was wrong; it was a mistake I did not forget or repeat.

Cancer of the liver substance is more obscure in its course; when it is secondary to cancer elsewhere it may be quite overlooked, being masked by the symptoms of the primary affection, so that it is only on the *post mortem* table that the liver lesion may be recognised. But in such a case the growths are small and not near the surface, or they should have been discovered, for the cancerous liver is enlarged, probably larger than in any other affection, its surface is studded with irregular masses which are painful on pressure, there is usually some ascites, and at least slight oedema of the ankles. The complexion is earthy or jaundiced if the bile ducts are involved, there is great loss of weight with failure of strength, impairment of appetite, and depression of spirits.

The picture is a sad one, the prognosis is hopeless, the treatment *nil*. The only ray of hope is that the diagnosis may be wrong, and that does sometimes happen. The late Professor Laycock of Edinburgh used to tell how at one time he suffered from jaundice with a stony lump to be felt below the right costal margin; his colleagues shook their heads and talked of cancer, but a dose of calomel took away the lump and the jaundice. The moral is not to be too cocksure about the existence of very grave internal diseases and to leave your patient a ray of hope in the possible fallibility of your diagnosis.

A few months ago an elderly gentleman of authoritative manners was shown into my consulting room, followed by his doctor, and after introducing him as Alderman ——, Mayor of ——, expressed himself somewhat as follows: He had come to have my candid opinion and no professional humbug; his brother had died of cancer of the liver recently; he believed that he was suffering from the same disease, so wanted to know the truth; he had consulted another physician who was not sure, which had not satisfied him. I made my examination, and came to the conclusion that he had cancer of the liver. I must say "Yes" or "No," or, like my colleague, profess uncertainty. I have always acted on the rule that if a patient asks for my candid opinion I ought to give it. I did so on this occasion; he thanked me, paid my fee, and went away. I heard subsequently that on his return home he put his affairs in order and died in about a month. I was told I had killed him. Perhaps I hastened his death, but I should do the same if the circumstances were to recur.

A friend of mine told me that he took a patient with cancer of the liver to consult the late Sir William

Gull, and was amazed to hear that eminent physician telling the patient that he hoped he would soon be well again. My friend took Gull aside and said, "But, Sir William, he knows he has cancer; I have told him so." The only answer he got was, "Pooh! pooh! My dear fellow, we never say such things to our patients."

There are the two methods; there is something to be said for each, and every man must decide for himself which he will follow according to his conscience, and so long as he is guided by his desire to do the best for the patient and not by any concern for his own interests, I will not say he is wrong, whichever course he adopts.

An eminent and very successful physician in consulting practice told me that when he was beginning practice he was advised by an older colleague, a connection by marriage, always to give a good prognosis on the highly immoral ground that it paid to do so. My friend's face showing at least surprise, his mentor proceeded to tell him the following story: he was called in consultation to the case of a gentleman who was extremely ill; he followed his rule, but the patient died a few minutes after he left the house. He admitted to himself that on that occasion he had probably created a bad impression, so that when a few weeks afterwards he recognized as the widow a lady in deep mourning who was shown into his consulting-room he began to apologise, but was interrupted by her protest, "Oh! Dr. ——, don't say a word about it; you were the only person who gave me any hope."

The Pancreas.—In old age the pancreas is frequently small, hard, and sclerosed, its glandular elements being atrophied, while its interstitial

connective tissue is increased, but these changes are not recognisable clinically in the present state of our knowledge.

Pancreatitis is often secondary to cholecystitis, to infective cholangitis, or to ulcer of the stomach or duodenum, but it is probable that in enfeebled states of the body bacteria with which the intestine is swarming can penetrate and infect the gland. Its symptoms when acute are those of peritonitis in the upper part of the abdomen, and the diagnosis is uncertain until the abdomen is opened, when the presence of fat necrosis on the peritoneal surfaces indicates that the pancreas is involved. This fat necrosis consists of whitish specks scattered over the peritoneum in the neighbourhood of the pancreas ; they are formed by calcium salts of the fatty acids, and it is supposed that the fat-splitting ferment of the pancreas escapes into the lymphatics and acts upon the fat it finds there, splitting it into fatty acid and glycerine ; the glycerine is absorbed, but the fatty acid unites with calcium to form soaps.

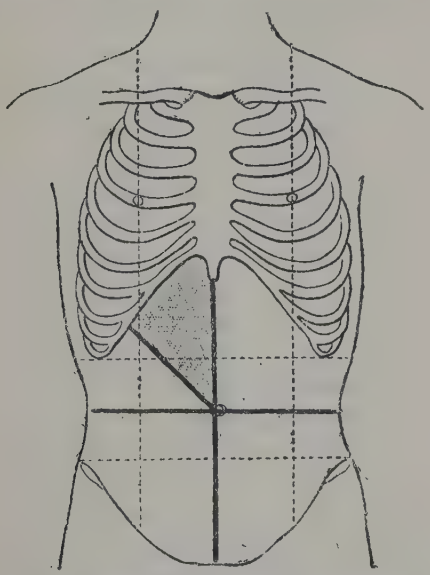
In pancreatitis, especially when accompanied by jaundice, there is a great tendency to haemorrhagic extravastation, giving rise to a condition called haemorrhagic pancreatitis ; it is fatal unless treated surgically.

Infective inflammation of the pancreatic duct may cause severe fever with paroxysms resembling ague.

Chronic pancreatitis runs a latent course until the gland is so deeply affected that diabetes develops.

Calculi composed of phosphate and carbonate of lime may form in the pancreatic ducts, and on passing into the duodenum cause painful attacks, closely resembling biliary colic, but the pain is felt

rather between the scalpulae than at the angle of the right scapula (Mayo Robson), although gall-stones sometimes cause pain right over the spine, or, as one medical sufferer described it to me, as if some one were tearing out one of his dorsal vertebrae; as the gall-stones in this case were subsequently removed by operation, the diagnosis is not open to doubt.



THE SHADED PORTION IS THE PANCREATIC AREA.

Just as there is a point of maximum tenderness in appendicitis and in cholecystitis, so there is an area specially associated with pancreatic painfulness; it is defined by drawing two lines at right angles, one vertical, the other horizontal, through the umbilicus, and bisecting the angle which lies to the right of the middle line, the pancreatic area being that nearest to the vertical line (see diagram).

Cancer of the pancreas is more especially the form of disease of this gland which is associated with advanced life. It may be painless, but gives rise to intense jaundice when seated in the head of the gland; there is generally great emaciation, and the stools show the characteristic derangement of intestinal digestion. According to some authorities, its course is very rapid, terminating by death in less than a year; but hospital statistics are apt to mislead in estimating the duration of disease, as these patients from their circumstances have not the best chance. An elderly Jewish lady, over seventy, lived for certainly two years, and although she was very thin and deeply jaundiced, went to the theatre every week; her life would probably have lasted longer had she not fallen against a marble table in her bedroom, cutting her head and losing a great deal of blood before she was discovered.

For the *diagnosis* of diseases of the pancreas it is important to analyse the faeces, and for this purpose a special test-meal should be given; in order to recognise the faeces which correspond to the meal, a cachet containing five grains of powdered carmine should be given during or at the end of the meal, which will give to the corresponding faeces a red or pink colour; in order still better to delimit the meal the patient may be put upon a milk diet for two days before the test-meal. This should be taken on the third day in the morning, and all food should be stopped for six or eight hours afterwards, only milk being allowed again in the evening. By this plan the faeces of the test-meal will be coloured red, and will contrast clearly with the pale faeces from the milk diet before and afterwards. The test-meal may consist of white bread 3 oz., beef finely minced

2 oz., butter 1 oz., milk ½ pint, potatoes 3 oz. The meat should be lightly cooked with a little butter in a stewpan; the potatoes should be boiled, passed through a sieve, and mashed with milk and some of the butter; the remainder of the butter should be spread on the bread, while the rest of the milk must be used as a drink. This meal eaten on one day in the early morning should be normally found in the stool on the following morning, but if the pancreatic secretion is defective it may be passed sooner. The quantity in health should be about three and a half ounces, but in pancreatic disease from defective absorption may be considerably more; in fact, large stools may be looked upon as a sign of pancreatic insufficiency (Oser); the consistency which is normally firm may be liquid or sticky; the odour nauseous or putrid, indicating abnormal digestive fermentations. In pancreatic disease under the microscope there are large quantities of undigested muscular fibres with an unusual amount of fat globules. In some cases the fat is present in masses of the consistence of butter when the stool has become cool, or the fat may float like oil on the surface of a liquid stool. The microscope will show, besides muscular fibres, a certain number of starch granules, but their absence would have no special significance, as even in pancreatic disease the starch digestion may go on perfectly. Fats under the microscope may show themselves either as droplets of various forms, the neutral fats, or as acicular crystals, the free fatty acids, or finally as amorphous or crystalline soaps. Chemical analysis shows that the carbohydrates have been relatively well utilised, as on fermentation little gas is formed, but the proteins have been only partially absorbed, the total nitrogen being 25 to 30 per cent. of the

ingested quantity instead of only 5 per cent. In some cases, where there is complete obstruction to the common duct, the nitrogen may be as high as 41 per cent. The estimation of fat is especially important, as in health this rarely exceeds 55 per cent. of the total ingested, but in pancreatic disease may rise as high as 85 per cent.

The examination of the urine is of importance, as in disease of the pancreas there is occasionally glycosuria, sometimes lipuria, oxalates of lime crystals are frequently deposited, while the special reaction called the reaction of Cammidge is claimed by its author to be a positive sign of great value.

The detection of glucose can be performed by any of the usual tests, of which Fehling's solution is perhaps the best; oxalate of lime crystals should be looked for with the microscope after the urine has been allowed to stand; the presence of fat in the urine has been observed on several occasions, but it is too rare to be of much assistance. Cammidge's reaction is a complicated process, a modification of the phenyl-hydrazin method of looking for sugar, and it is therefore important to exclude the presence of sugar before this test is undertaken. Its value is still in dispute.

CHAPTER VIII

Diseases of the Genito-Urinary System

The Kidneys—Acute and Chronic Nephritis—Renal Calculus—Pyelitis—Cancer of Kidney—Stone in the Bladder—Cystitis—Prostatic Disease—Tubercle and Growths of the Bladder—Epithelioma of Penis.

The Kidneys and Bladder

The **kidneys** are so liable to suffer in the course of time that these organs rarely present unaltered anatomical appearances in the bodies of old persons. It is true that, especially in women, these changes have not always had much clinical significance yet albumen in traces is often to be found in the urine of the aged, and they suffer so frequently from the various complications of Bright's disease that it is no exaggeration to say that the kidneys play a preponderating part in the pathology of old age.

The doctrine of renal inadequacy taught by the late Sir Andrew Clark had no solid foundation and is now abandoned; there is no ground for the belief that there is a functional failure preceding that of anatomical change; rather the reverse is true that anatomical changes take place insidiously and are well advanced before they produce any sensible alteration in the work of the kidney; its secretion is not diminished and the total solids maintain for a long time their normal level, although ultimately they show a gradual reduction.

The latency of chronic renal disease in old people

is unfortunately too common, so that the first indication may be an attack of renal asthma or a cerebral haemorrhage in a person who was taking a full share in the active duties of life, and generally supposed to be in good health. If people who have passed the age of sixty would allow themselves to be examined once a year it is probable that their lives would be prolonged, as the early detection of slight renal trouble should lead to a modification of their mode of life which would conduce to the arrest or postponement of those progressive changes that if left to themselves will sap the foundation of their lives.

Acute nephritis, when it occurs in old age, is almost invariably implanted upon organs already diseased, and consequently susceptible. Owing to the comparative immunity of the old from infection they are less likely to suffer from the action of infective toxins, but the impaired condition of the kidneys which is so commonly present lowers their resistance when infection takes place. This is seen especially in septic infection of the bladder which is often fatal to old men from its secondary effects on the kidneys. For this reason acute nephritis in the old is a rapidly fatal disease, often causing death by suppression of urine and uraemia without giving rise to dropsy. The heart fails, the lungs become oedematous, the tongue is dry and brown, there is complete loss of appetite, drowsiness passes into coma and death soon puts an end to the pitiful performance. There is not much opportunity for treatment and this is rarely successful; the worn-out body is not a hopeful subject for bleeding, sweating, or purging; there is rarely time to prepare an autogenous vaccine, and any other is of little use.

It would be a mistake to suppose that the presence of albuminuria by itself indicates the imminence of a fatal sequence like that just described; albumen in small amount may mean little, but if the quantity of urine is diminished and the proportion of albumen is large the prognosis should be grave. Albumen should be looked for diligently in all acute affections of old age on account of the serious significance it bears.

If acute nephritis in old age is characterised by its rapidly fatal evolution **chronic nephritis** is slow in its progress, latent in its course, and even when discovered not inconsistent with some duration of life. The most trustworthy sign of its extent and danger is the state of the heart; if that is dilated and there are any signs of failure life will be short, but its response to cardiac remedies may modify for the time this serious view. So long as the heart's apex is not displaced the prospect is fair, provided always that the patient will conform his mode of life to the state of his organs. If a low protein diet is that which is generally conducive to longevity it becomes imperative here; and there must be abstinence or marked moderation in the use of alcohol, tobacco, tea, and coffee. In looking over some old papers to-day, I came across the notes of a case in which the patient admitted that six or seven years previously he had taken alcohol to excess, and had had an attack of alcoholic neuritis from which he had recovered, but at the time I made these notes he took alcohol "moderately"; on being asked to say what amount he was taking, he said, six glasses of beer and six glasses of whisky daily! This is not the sort of moderation which will suit these sufferers from chronic Bright's disease; 1 oz. of

whisky, or 4 oz. of light wine well diluted with water or mineral water is the utmost that should be allowed to those for whom it is thought not desirable to deprive them entirely of a long-accustomed stimulant.

Chronic Bright's disease in old persons rarely develops anasarca, but as the heart fails there often is some oedema of the lower extremities; it is a frequent cause of bronchitis or of pleurisy, or pericarditis, of renal asthma, of heart symptoms, of apoplexy, of epilepsy or uraemic convulsions, of uraemic hemiplegia more rarely, and of haemorrhages, including purpura, haematuria, melaena, and epistaxis. The only fatal cases of epistaxis I have met with have been associated with latent chronic Bright's disease.

When the disease is recognised and symptoms suggest the need for *treatment*, a purin free diet should be instituted. This means abstinence from meat of any kind, from asparagus, peas, beans, lentils, and oatmeal, tea, coffee, and cocoa; alcohol also should be prohibited.

The protein of the diet, which need not exceed 50 grammes daily, can be supplied in the form of milk, eggs, cheese, and the protein of bread and other cereals; fat may be allowed freely; and carbohydrates in sufficiency. Such a dietary will be found in Appendix II., No. 2.

The most useful drugs are cardiac tonics, of which digitalis or Nativelle's digitaline takes the chief place. Strophanthus convallaria sparteine and nux vomica may give useful help. After these come iodide of potassium, trinitrine and erythrol, which in the later stages often afford great relief. For the insomnia that may be so distressing chloral and veronal are the most trustworthy drugs to employ, but chloral should not be used when the heart is failing.

In the treatment of renal asthma a granule of Nativelle's digitaline (gr. $\frac{1}{120}$) may be given every four hours alternatively with a tablet of erythrol (gr. $\frac{1}{4}$), so that one or the other is taken every two hours. I have found this plan more successful than any other, and I may say that I have tried all the remedies that have been recommended. Sometimes erythrol causes such intense headache that it has to be given up, when 2 minim doses of trinitrine should replace it.

In uraemic conditions the hot air bath given while the patient is lying in bed for twenty minutes affords the best results, but in urgent circumstances we may bleed to ten or fifteen ounces.

Haemorrhages may be checked by the local application of adrenaline, and by the internal administration of lactate or chloride of calcium, 10 grains three times a day, but this symptom is often of grave augury and presages the approach of the end.

Chronic Bright's disease, according to the latest report of the Registrar General (1910), is responsible for the deaths of 289 persons per million living, and is more prevalent in males than in females, the figure being males 319 per million, females 261 per million. The highest mortality occurs between the ages of fifty-five and seventy-five, but if we include the thirty years from forty-five to seventy-five we find that 70 per cent. of the male deaths and 66 per cent. of the female deaths fall within this period, a proportion which is all the more striking as the number of persons living at these ages is of course less than in the first forty-five years of life, so that chronic Bright's disease takes a high place among the causes of death in advanced life.

Stone in the kidney may occur at any age, but attacks of renal colic usually cease when old age begins. This is probably due to changed habits, although it is not quite clear why "goutiness" persists or even develops in advanced life, although acute gout is rare. Charcot describes gout as a disease of old age—wrongly, if the typical attacks of arthritis are to be regarded as peculiarly entitled to be called "gout," as no doubt they are. When stone in the kidney attacks an old man it is almost invariably of the uric acid kind, and is probably only a recurrence of an ancient trouble; the kidneys are likely to be more or less disorganised, and one may be entirely *hors de combat*, so that there is greater risk of total and perhaps fatal suppression of urine. This may occasionally occur, as Sir Rickman Godlee's case showed, from sympathetic inhibition of the other kidney without blocking of its ureter or macroscopical change, although the microscope in that case showed that the renal substance was not intact.

Apart from this greater danger an attack of renal colic does not differ in its course from that occurring earlier in life. There is the same sudden onset, the agonising pain in the loin shooting down the course of the ureter, retraction of the testicle and vomiting. The treatment should be by hot applications to the seat of pain, and it is well to hesitate before giving a hypodermic injection of morphia, although it is not possible to lay down an absolute prohibition, as the pain may be and often is intolerable while the disease of the kidneys may be and often is not so advanced as to render its use dangerous. The worst of it is that we may know little about the patient's previous condition, although the state of the heart may enable us to form some

estimate of the extent and duration of the disease of the kidney substance.

If the stone passes into the bladder it will probably escape after a few days by the urethra; but if it does not, it should be sought for by the sound and removed by the lithotrite before it has had time to cause more trouble.

When it remains in the kidney, or in those cases where there has been no attack of renal colic but there is localised pain in the loin with only constant microscopical amounts of blood and pus in the urine, it is right to try the effect of solvents, especially where there is reason to believe from the presence of uric acid crystals in the urine that it is a uric acid stone. But an oxalate stone, although insoluble, is often quite small, and may pass naturally if time be allowed. Unless there is a perinephritic abscess operative interference may be postponed until a course of medical treatment has been tried.

For uric acid stone the patient should be put on a purin free diet without alcohol (Appendix II., No. 2) and induced to drink a bottle of Vichy water, either Celestins or Haute Rive daily, while he may take fifteen grains of urotropine well diluted with water every night at bedtime.

For an oxalate stone the diet should be that recommended by Klemperer (Appendix II., No. 4) consisting of animal food with those vegetables and fruits only which contain little cellulose; a bottle of Contrèxeville water should be drunk daily; alcoholic drinks in moderation may be permitted.

For uric acid stones a cure at Vichy or Vittel may be tried, while oxaluric patients should be sent to Contrèxeville, Vittel or Evian les Bains.

The use of radiography is of help in the recognition

of a renal calculus, as a fair-sized stone gives a shadow about which there can be no doubt, but a negative result does not prove the absence of a stone, and unfortunately this is not an uncommon result, even where the subsequent history of the case leaves no doubt that there was one. This is probably caused by the small size of the foreign body and the thickness of the muscles. Phleboliths in the iliac vein have been misread for calculi in the ureter.

Pyelitis, or purulent inflammation of the pelvis of the kidney, may follow an acute infectious disease such as typhoid fever, or parturition, or complicate the presence of a stone. It is chiefly from the last cause that it is seen in old age, and then indicates urgently a surgical exploration of the kidney. When it occurs independently of a foreign body it is better left alone, and should be treated by rest, diluents and in the post-typhoid cases by nightly doses of urotropine (15 grains) well diluted with water.

Parturition cases, where the microbe is generally the bacillus coli, seem suitable for vaccine treatment; but the vaccine should be prepared from cultures made from the patient wherever this is possible, although a bought vaccine may be tried where the services of an expert to prepare the culture cannot be obtained.

Cancer of the kidney is so like stone in its symptoms that the condition may not be recognised before operation, which is generally undertaken for persistent haematuria, but the lucky detection of a fragment of growth in the urine has occasionally permitted a certain diagonosis to be made earlier, or a shrewd guess at the real nature of the case may be based upon the age of the patient, the absence of

previous attacks of renal lithiasis or gout, the persistence and amount of the haemorrhage, the progressive emaciation and enfeeblement of the patient, or the presence of a palpable and painful tumour in the lumbar region.

The only treatment that holds out a reasonable prospect of success is surgical, but this is not likely to be attained if we wait until the diagnosis is certain, but sometimes falls to the lucky surgeon who opens a kidney for persistent bleeding and finds it the seat of a growth.

Stone in the bladder, while occurring at all ages, is especially an affection of advanced life. Better means of diagnosis and lithotrity have deprived it of much of its former terrors, and the most important matter for the practitioner to bear in mind is the need for early diagnosis. Its symptoms are like those of cystitis and also those of enlarged prostate, but the presence of either or both does not exclude stone. The pain is apt to be greater than in simple prostatic disease, and haemorrhage is more common than in uncomplicated cystitis ; the character of the pain that is significant is its occurrence after micturition and its reference to the tip of the penis. It is well to remember that occasionally the local symptoms caused by a stone in the bladder are not very marked, and that the patient may complain of cardiac or digestive disturbance that may divert one's attention from the bladder condition, although the stone is the real cause of all the complaints and their cure really depends upon its removal. Mistakes of this kind can only be avoided by care, by avoiding hasty conclusions, and by thorough examination. There is no excuse for the well-paid specialist who is helped by his better training and can afford the time to take

his cases deliberately, but such oversights are only too likely to occur in the hurry of general practice, and in the great extension of contract practice which the future appears to promise, are likely to be more common.

The treatment of stone in the bladder is exclusively surgical, and no time should be wasted on medical treatment. In these days lithotrity has removed the objections that patients felt to any operation that involved the use of the knife, and procrastination in obtaining surgical help must be emphatically condemned.

Prostatic enlargement is present in about 34 per cent. of men over sixty. Such old men are peculiarly liable to *cystitis*, which is generally caused by the prostatic enlargement preventing the perfect emptying of the bladder; it may in other cases depend on gout and the irritation of the bladder by uric acid crystals. The proximate cause in many cases is the infection of the bladder by the bacillus coli, most commonly, but not always, the result of the use of instruments. Washing out the bladder is a procedure that has been much abused, and has probably done on the whole more harm than good.

If there is prostatic enlargement sufficient to cause permanent urinary stasis the sooner the gland is removed the better. The technique of the operation is now so perfect that in the hands of a skilful surgeon it presents little risk and may save years of misery. No doubt it should not be undertaken where there is already serious kidney disease, but this is generally the result of delay, and means that operation has been undertaken too late. The operation of prostatectomy is one of the greatest benefits that the advance of modern surgical technique has conferred on old age,

for the sufferings that were endured by the subjects of prostatic enlargement in past times were terrible.

A patient of mine, aged fifty-eight, whose prostate was beginning to enlarge, found himself at a Highland shooting unable to pass water. The local doctor tried to assist him with a silver catheter, but only hurt him horribly and caused bleeding. He had to remain unrelieved until the next day when a surgeon arrived from Aberdeen who passed a catheter and tied it in. As soon as arrangements could be made the operation of vasectomy was performed, first on one side and, after an interval, on the other. He was sent home when he was able to travel and came under my care. The bladder could be emptied without difficulty, but the testicles were atrophied to the size of almonds. He went on very well until the following spring when he had an alarming heart attack while on a visit to a married daughter. I saw him again on his return home and found his heart dilated. From this time until his death in the following autumn, a year after the operation, his heart steadily failed in spite of all treatment. I believe the rapid failure of the heart was the consequence of the injury to the testicles, for he was not an old man for his age at the time of the operation, and might have expected to live for another ten or twelve years.

It must not be supposed that all cases require a surgical operation. This is far from being true, and if the surgical aspect has been put forward first it is on account of its great importance, for in practice, and especially in hospital practice, there are too many cases for which surgical help is essential, wasting important time, getting worse instead of better, adding kidney mischief to bladder trouble,

by persevering with doctor's bottles or quack remedies, when only surgery could afford the needed relief.

Cystitis may give rise to pain, especially after passing water, felt in the perineum or above the pubes; the water is passed frequently, and the quantity is small because the bladder is irritable and will not hold more than three or four ounces; above all, the urine is turbid when passed, and under the microscope is seen to contain pus. For slight cases microscopic examination is essential for the diagnosis, otherwise simple earthy phosphates may be mistaken for pus. The urine in these slight cases is acid to litmus paper turning it red, and often deposits uric acid crystals in lumps visible to the eye. In more severe cases the urine is ropy from the presence of mucus in excess, and there may be blood as well as much pus, and where infection has occurred it is alkaline and ammoniacal from decomposition of the urea and the formation of ammonium carbonate.

Rest is the first need; the patient must go to bed and stay there for at least a few days. The result in mild cases is immediately beneficial, for it is characteristic of slight cystitis, as distinguishing it from the irritability of the bladder caused by prostatic enlargement, that the frequency of micturition occurs more by day than by night and disappears when the patient is put to bed. The diet should consist of milk and farinaceous food, with stewed fruit and diluent drinks such as barley water. (See Appendix III.) The bowels should be kept open by a saline laxative if, as is often the case, they do not act naturally when the patient is in bed. A teaspoonful or two of sulphate of magnesia or sulphate

of soda dissolved in hot water and taken the first thing in the morning is usually sufficient. The acidity of the urine should be corrected by an alkaline mixture of bromide and carbonate of potash of each ten grains, with tincture of hyoscyamus or belladonna ten minims, in infusion of Buchu two to four ounces, given three or four times a day. A belladonna suppository (B.P.) may be used daily at first if the irritability of the bladder persists. If infection has occurred ten grains of urotropine should be included in each dose of the mixture.

The presence of an old urethral stricture is an unfavourable complication, and is often a factor of importance in causing the cystitis, even where micturition is fairly performed. Its presence is indicated not by a sluggish stream or by some dribbling which is common in old men and may mean only weakening of the expulsive force of the bladder, but a thin twisted or forked stream is more significant. Even then it is not advisable to introduce an instrument so long as there is no retention, but Sir Henry Thompson's warning should always be borne in mind, that frequent micturition in an elderly person is as likely as not to be caused by an over-distended bladder. This point can easily be cleared up by percussing the abdomen above the pubes, where an area of dulness and in spare individuals a pear-shaped tumour can be made out. When this is present the bladder should be emptied slowly by introducing a well-boiled Jacques catheter, bearing in mind that where the distention is extreme it is better to draw off only part of the urine at first so as to give time for the bladder to contract, as haemorrhage has occurred from sudden withdrawal of the whole of the fluid that has been for some time

supporting its walls. These cases are most often dependent upon prostatic enlargement, a question which can readily be determined by a finger in the rectum, and if present the desirability of surgical aid should be discussed. It is quite true that an elderly man may get retention from an acute prostatic enlargement after exposure to cold or after a good dinner with plenty of wine; so that on the first occasion there may be no hurry to propose an operation, but the case must be watched, and no harm can come from discussing the state of matters with the patient, who has been probably considerably alarmed, and may be expected to do his best to prevent a recurrence of an attack in so far as it has depended upon his own imprudence.

A week's rest in bed will do much for our patient with cystitis, he may then be allowed to get up with the warning not to be too much on his feet; to restrict his diet, to avoid alcohol, and drink sparingly of tea and coffee. Mineral waters are useful, especially those of Contrèxeville, Vittel, and Evian which may be taken at home as table waters, but are not any good in less quantity than a bottle daily. A course of treatment at either of these spas during the summer months may be suggested, provided the patient is in good general health and his circumstances render such a proposal reasonable. Well-to-do patients are perhaps too ready to go abroad to health resorts irrespective of their condition and the probability of benefit; they decide for themselves, often acting not upon medical advice but on that of even a club acquaintance, and without sufficient knowledge either of their own state of health or of the therapeutic properties of the waters they propose to take. In the course of several tours of inspection to

continental spas a few years ago I came across many such cases; but it is to be regretted that even when medical advice is sought upon the subject the family medical attendant is not always equal to the occasion.

On one of my visits I met an elderly couple at a French spa which at that time was little known, and where they were almost the only English in the place. In the course of conversation I asked how it was they had come there? The lady said that she had asked her family doctor to recommend a suitable place and he had promised to make inquiries. A few days later he returned with three names written on a piece of paper which was left lying on the table, where it was seen by a nephew who called and who asked the meaning of it. When he was told, he said he had once visited —— when he was staying in the neighbourhood, and so on no better recommendation they decided to come, and they did not regret their decision, but it was much like a toss-up.

As most of these places are pleasant enough, and the treatment nowadays seldom drastic, there is not much risk if the patient is in fairly good health; the real danger to be avoided is that of sending any one away from home when there is any likelihood of the occurrence of serious illness or even of death in a foreign country at a distance from family and friends in a hotel among strangers.

I was much amused at an old gentleman whom I was endeavouring to dissuade from a projected journey to Riviera when he was suffering from a progressive disease which proved fatal in a few months. I would not tell him the brutal truth but I spoke of the comforts of his home as compared with those of hotel life, and all I got in reply was

"My dear Sir, that shows how little you know of the resources of a first-class hotel." However, between us we managed to keep him at home.

The presence of glycosuria in an elderly patient in fairly good health should not be allowed to stand in the way of a prostatectomy otherwise indicated.

A medical friend, aged seventy-two, who had had mild glycosuria for some years, was troubled with an enlarged prostate which compelled him to use a catheter regularly. He had consulted an eminent surgeon who refused to operate on account of the glycosuria. One day he came to me and said "F. says that if you will say that the sugar does not formally contraindicate the operation he will do it." I gave my consent and his prostate was removed; he made a good recovery, regained complete control of his bladder and when I next saw him he seemed rejuvenated; he expressed himself as feeling as well as he ever had been in his life, and added, "To think that I should have had to use that wretched catheter for all those years!" His only regret was that he had retired from practice. Unfortunately, he did not live long to enjoy the fruits of skilful surgery, but his death was from a cause quite independent of his urinary troubles.

Tubercle of the bladder is more often met with in youth or middle age than in the old, but is at all times a most distressing complaint. Often the first indication is an attack of haematuria, and for some time even cystoscopic examination may afford only indecisive information, for I can recall several cases in which a doubtful opinion leaning towards tubercle had been expressed, but which in the subsequent history there has been no development of bladder trouble, while in others an interval of several

years elapsed after the first attack of haematuria before the disease gave rise to important symptoms.

The course of tuberculosis of the bladder involves so much misery that an attempt should be made to diagnose and treat each case clearly. This may now be done by tuberculin first as a diagnostic aid, and secondly as a remedy. In skilled hands it would be, in my opinion, preferable in a doubtful case to give a course of tuberculin than to run any risk of allowing the disease to make headway by delay. There is no other remedy or any hope if the condition becomes established.

Growths in the bladder and prostate, especially cancer, may occur in old age, and though relatively rare are productive of much suffering. In them, too, the first symptom is haematuria, but there is generally, though not always, a good deal of pain from the first. The cystoscope may clear up the diagnosis, and removal may be possible. Where it is it should certainly be tried as affording a chance of escape from a terrible form of disease, while even death after the operation is a means of escape from a prolonged agony. In some old people, however, the symptoms may be comparatively mild. A lady aged sixty-eight was seen by me in consultation about five years before she died; her symptoms were chiefly slight haematuria with lumbar pain, and the case had been regarded as one of Bright's disease. I did not agree with this view, but thought there might be a stone in the kidney; it was before the days of radiography, and as there were no urgent symptoms there seemed no reason to interfere. So things went on without much change for about four years, when there was a profuse haematuria, and about the same time a change in the family medical attendant.

I saw her again and suggested a cystoscopic examination, but the matter was put off and remained in abeyance until in course of time the haemorrhage recurred several times at shorter intervals. A surgeon was called in who made nothing out with the cystoscope so opened the bladder above the pubis, when we saw the bladder almost filled with a vascular growth which could not be removed, and the patient died shortly after the operation. The absence of definite bladder symptoms throughout the course of this case was remarkable.

A case of cancer of the prostate lasted quite as long, but was not so benign in its course. The patient, a well-known medical practitioner aged fifty, began to suffer from haematuria and consulted Sir James Paget, who recognised the disease to be cancer. I saw him soon afterwards and found the prostate to be large and of stony hardness. It was before the days of prostatectomy and nothing was done. The patient continued to do his work but lost control over his bladder to some extent, so that he had to wear a urinal. Later, on account of difficulty of micturition, a perineal section was performed, but he did not survive many weeks. When I first saw him the condition seemed favourable for enucleation, which would give such a case a chance of cure, although with the possibility of recurrence his life might not have lasted longer than it did. He had the best surgical advice available in those days, but the ultimate operation proved useless, and apparently hastened his end. The cystoscope and suprapubic cystotomy are great helps in the treatment of these cases, for at any rate the surgeon can see what he has to deal with, both before and during the operation, and radical removal is at least possible where

the base of the bladder is not involved in the growth.

Epithelioma of the penis usually attacks the glans often in the neighbourhood of the frenum; it generally begins as a papilloma, and possibly is benign in its earlier stages when prompt removal would effect a cure, but if neglected until it begins to grow rapidly the glands in the groin are by this time infected and little can be done. It is rare before forty years of age and gouty balanitis is a predisposing cause.

Sarcoma of the corpora cavernosa may be either primary or secondary; the only treatment is amputation of the penis.

Gouty thrombosis of the penile veins is a troublesome accident that sometimes happen, and may give rise to alarm from the peculiar deformity resulting, or from dread that the hard lump is a growth of some kind. **Gouty urethritis** with heat and swelling of the penis may resemble acute gonorrhoea; gouty balanitis and gouty cavernitis may also occur. In all these conditions rest is essential with saline purgatives and restricted diet. The organ should be wrapped in cotton wool or Gamgee tissue.

CHAPTER IX

Diathetic Diseases

Acute and Chronic Rheumatism—Muscular Rheumatism—Rheumatoid Arthritis—Gout—Emaciation—Obesity—Glycosuria—Diabetes—Diabetes Insipidus—Alcoholism.

Rheumatism

Although one naturally thinks of **acute rheumatism** as a disease of young adults, about 10 per cent. of all deaths from it occur after fifty-five years of age, and it is slightly more common in old women than in old men. The disease at this period does not differ in its course from that seen in earlier life, and its gravity depends mainly upon the amount of old organic mischief present in the particular patient attacked. The existence of endocarditis, or chronic nephritis necessarily complicates the case apart from such general circumstances as advanced age, debility, and poverty.

All cases of acute rheumatism should be put to bed between blankets, the affected joints should be wrapped in cotton wool and bandaged, while if there is great pain they should be supported on splints. Fortunately, since the introduction of the salicylate treatment there is little pain after the medicine has had time to take effect. Salicylate of soda in ten grain doses should be given every hour until the pain is relieved, and experience shows that this occurs generally after six or eight doses. The medicine is then

continued every two hours for the next two days. and may then be gradually reduced to every three and every four hours, at which last it should be maintained for a fortnight, however well the patient may seem, nor should he be allowed to quit his bed until after that time has elapsed. The reasons for making this rule are the liability to relapse and the impossibility of being sure that there is no endocarditis.

The diet should be milk diluted with barley water, farinaceous foods of any kind, stewed fruit, fruit juices, and lemonade. In the second week, fish, chicken, vegetable purées, and tea or coffee may be allowed. Alcohol is not necessary, and beer and wines should be forbidden.

The hands of old persons are apt to be deformed by rheumatism in various ways. One common deformity is that called Dupuytren's contraction, generally affecting the little finger, which is flexed and drawn down to the palm by contraction of the palmar fascia. This deformity is permanent. Another form common in old women is that called Heberden's nodes, in which painless rounded bony excrescences grow at the bases of the distal phalanges causing slight deviation of the tips of the fingers and a little impairment of their movements.

Pierre Marie and Leri have described a special rheumatic deformity of the hand in persons over fifty-five years of age, which is characterised by swelling of the dorsal aspect of the metacarpo-phalangeal joints of the index and middle finger, the index always showing most alteration. The external (radial) border of the joint of the index projects abnormally; the thumb is bent forming a dorsal concavity; these changes are painless; X-ray photographs show opaque deposits like those seen in

chronic rheumatism, and white patches of urate of soda.

Parisot and Etienne have described a form of chronic rheumatism of the hand under the name of senile arthropathy of the fingers; it presents thickening of the bases of the phalangeal joints and attacks all the fingers. Radiography shows enlargement of the heads of the phalanges.

Muscular rheumatism is a painful affection of certain groups of muscles, chiefly of the trunk or of those attaching the limbs to the trunk. The condition is obscure, and is sometimes called myalgia to avoid giving it a name which implies any theory as to its pathological relations. The most severe form in which it occurs is **acute lumbago**; this comes on suddenly with severe tearing pain on one or both sides of the loins, but spreads rapidly to involve all the muscles and often radiates down both sciatic nerves. It may amount to agony, is increased by movement, and is paralysing by its intensity; it is relieved by anything that supports the muscles and keeps them at rest. All degrees of this painful affection may be experienced by those who suffer from it. Its causation is obscure; it may come on when the patient feels himself to be in excellent health and free from any rheumatic pains. Cold and wet, especially sudden changes of temperature and moisture, seem to have most influence upon it, but although more common in the winter the summer in this country affords no immunity from it. Some sufferers blame unwonted indulgence in malt liquors, port wine, or champagne, but it bears no constant relation to these factors although they are probably at fault at times. Attacks often come on after taking a cold bath or getting wet to the skin.

Those who are subject to this painful disorder should avoid malt liquors, port wine, Madeira, sherry, and champagne, should sleep in the winter between blankets, or rolled up in a small blanket, or use Jaeger sheets all the year round; they should always wear woollen underclothing, but this may be light; they should not bathe in cold water, and avoid getting wet.

The onset of the attack is fortunately not always sudden and violent, but its beginnings should be treated promptly to prevent worse happening. The most efficient remedy is a stiff, well-fitting belt, which should be worn next to the skin to prevent it slipping. The Jaeger shops sell a suitable article called a "Tyrol" belt, which is made of stout inelastic felt, is lined with fine white flannel, and is fastened by a broad strap of webbing with a buckle. It should fit so tightly as to give good support to the loins and keep the muscles at rest, yet while wearing such a belt the patient can get about and do his work, by which recovery is not retarded, while lying in bed affords no relief, and is a miserable way of passing the time.

Ironing the muscles with a hot flat-iron, a piece of brown paper or flannel being interposed, sometimes acts like a charm, but at other times does no good.

Radiant heat should certainly be tried, and when in bed an indiarubber hot water bottle should be applied to the seat of the pain.

The effect of drugs is not great. In a very acute attack a hypodermic injection of morphia may be absolutely necessary to relieve the cruel pain. Aspirin in twenty grain doses, or any of the same group of remedies, should be tried. There is a chemist at Tewkesbury who sells a specific for lumbago which appears to be simply tincture of Guaiacum, but its

effects are not striking, and if Guaiacum is to be tried the tincture is a disagreeable way of giving it; it is preferable to prescribe the powdered resin suspended in milk, or the Mistura Guaiaci B.P., as either is nearly tasteless; the dose of the Tewkesbury specific is a teaspoonful, of the powdered Guaiacum twenty grains, of the Mistura one ounce. At the beginning of treatment a cathartic pill should be given, such as four grains of compound colocynth.

Rheumatoid Arthritis.—The somewhat ill-defined condition that is called rheumatoid arthritis is at least in some of its forms specially associated with old age, as is testified by the name "morbus coxae senilis," borne by the monoarticular hip joint affection which is one of its commonest and most typical manifestations.

While deaths from gout are four times as common in men as in women, rheumatoid arthritis more than restores the balance, the total number of male deaths from the two conditions being 601, and of female 822. It begins to be more common in both sexes after forty-five, when senile changes set in, and there seems to be no more definite relation than this between it and the menopause. It is undoubtedly often started and immensely aggravated by local injuries. How far it is related to microbial infection is not certain. Pneumococcal and gonorrhoeal infections cause an arthritis which may be general or local, and is so like what we recognise as "rheumatoid arthritis" that it is not unreasonable to believe that the latter has a similar origin which has not been at present discovered. Another analogy of which perhaps too much has been made is the arthropathy of Tabes or Charcot's joint, which, when first shown, was recognised by surgeons as the condition known to them as

monoarticular rheumatoid arthritis; however, there are points of distinction of which the most important is the painlessness of the Charcot joint, and apart from a superficial resemblance there is little to support the belief that rheumatoid arthritis is a neuropathic affection. It is a disease which is at the present time the subject of much investigation, especially at Cambridge, so that we may hope its obscurities will be soon cleared away.

The various clinical forms of the disease are (1) general progressive arthritis affecting many joints, especially the smaller joints of the hands and feet; (2) partial or monoarticular affecting one or more large joints, especially the hip and the knee; this form often appears to follow an injury, although the precise relations are not clear; (3) spondylitis deformans, where the disease involves the intervertebral articulations, and leads to immobility and kyphosis of the spinal column, fixation of the ribs, immobility of the thorax, with consequent abdominal respiration. In all three there may be paraesthesia and muscular wasting.

The prognosis is doubtful, some cases doing well and others resisting all treatment, probably because we have not learnt to distinguish them. The uncured cases are to be found plentifully in our homes for incurables and the wards of our workhouses; but many cases are restored to active life by treatment at Buxton. I have sent every year hospital patients to the Devonshire Hospital at Buxton with the greatest and most lasting benefit, and any one who knows the routine of treatment in that institution will find it hard to attribute the result to anything but the air and the baths. Cases should go to Buxton only in the warm weather, and a cold summer is fatal

to the curative effect of the treatment. So convinced am I of the value of Buxton for these cases that I should like it to be reserved for them.

Drugs are of little use, although it is usual to try iodide of potassium, salicylate of soda, aspirin, and guaiacum. Rest and external applications of iodine liniment are of some good. Radiant heat baths may be tried, but in some cases increase the pain.

Gout

The theory that Gout is caused by the accumulation of uric acid or its salts in the blood, and that its local manifestations depend upon the deposits of salts in the tissues or the " poisoning " of cells by blood loaded with uric acid is still the most popular explanation of the condition, although it has had in recent years to encounter a good deal of criticism.

It was formerly believed that the excess of uric acid resulted from defective oxidation (Bouchard), but there appears to be no difference in the consumption of oxygen between the gouty patient and the healthy man (Magnus-Levy). There is, however, a tendency in the gouty to nitrogen retention, interrupted by periods during which the excretion of nitrogen is above the normal, for example, during the gouty paroxysm. It has been maintained by some that this retention is the consequence of diseased kidneys, but while chronic nephritis is common enough in gouty subjects the attacks of gout in so many precede by such a long period the first indication of nephritis, while other notably gouty subjects attain to a great age without ever manifesting these indications at any time, that it is impossible to believe the kidneys play a primary and essential part.

Uric acid is formed in two ways, (1) from the breaking down of the cells of the body, the so-called "endogenous" uric acid; and (2) from the purin bases of the food, the "exogenous" uric acid. The former is very small in amount, not amounting to more than 0·3 to 0 5 gramme daily, while the latter depends upon the quantity of purins supplied in the food. In gouty persons this relation undergoes alteration, although on a purin free diet the gouty patient excretes a normal amount, that is, the output of uric acid is the same in a gouty as in a healthy man; but when food containing purins is added, which in a healthy man would cause uric acid to appear in the urine to the extent of about 50 per cent. of its contents, the urine of the gouty man shows only a very trifling increase, provided no acute paroxysm of gout occur. Alkalies have little effect on this excretion, but salicylate of soda causes a marked temporary increase; alcohol lowers the excretion, and weak saline mineral waters raise it, while the prolonged use of a diet poor in purin bodies increases the power of elimination.

In gout the catabolism of purins is usually but not invariably retarded, yet in course of time is always completed. There is some indication that the oxidation of uric acid is reduced, but this has not been demonstrated. There is retention of uric acid in the body, as is shown by the deposits in the tissues; but, apart from this, elimination, although fluctuating, is in the long run duly performed.

The blood in gout contains excess of uric acid as it does also in chronic nephritis and plumbism, and temporarily in leukaemia, leucocytosis, parenchymatous hepatitis, and after the excessive ingestion of purins; yet in only one of these conditions do we

speak of gout. It is not clear why the blood in gout contains excess of uric acid; in many chronic cases the output of uric acid by the urine is normal, in most acute cases there is a fall before the attacks, followed by a rise afterwards, and in only some instances has a slight reduction of the regular output been found. As Alonzo Taylor says "the figures for this reduced elimination are not convincing."

Futcher thinks there is most evidence in support of the view that the excess depends upon the deficiency of some ferment (oxidase) that should convert uric acid into urea, etc.

Uratic deposits have been found *post mortem* in many internal organs, but they are rather pathological curiosities without clinical interest. The gouty kidney is a well-known form of chronic Bright's disease, in which on section whitish striae are seen in the pyramids; these are formed by uratic deposits in the collecting tubeles. The kidney in other respects conforms to the type of the granular contracting kidney, and its clinical symptoms correspond to that disease.

The deformities due to gout are (1) alterations in joints with subluxations and contractions of tendons, especially in the metatarso-phalangeal joint of the great toe, in the fingers, the knee, and the ankle; and (2) uratic deposits or tophi situated in the cartilages of the ear, under the skin of the knuckles and fingers, in the eyelids and the ligaments and tendons, more rarely in the vocal chords. Soon after the case of the late Emperor Frederick had attracted professional attention to epithelioma of the vocal chords, a middle-aged clergyman of my acquaintance had some voice trouble for which he consulted a surgeon. On one vocal chord there was a sessile whitish outgrowth

which looked so like epithelioma that it was decided to operate; the larynx was laid open and the little "growth" touched with the point of a scalpel, when it shelled out of its cavity and proved to be nothing more serious than a uratic concretion.

Ebstein has long held the opinion that the deposit of urates takes place only in tissues which are already damaged, but *post mortem* examination shows the frequency with which urates may be found in the tissues of the great toe joint for example, although there is no history of any gouty attack in the joint. Von Noorden accepts this sequence postulating the presence of a specific ferment to which the primary tissue changes are due, but both he and Ebstein fail to produce any satisfactory evidence to justify giving up the more general view that uricaemia leads to the deposit of urates in certain tissues poorly supplied with blood-vessels, and that these structures, when so infiltrated, are liable to become the seat of an acute attack of gout as a consequence of mechanical injury or impact, as in walking.

It is now regarded as impossible to attribute the precipitation of urates to diminished alkalinity, or to saturation of the blood plasma. Schittenhelm has shown that certain tissues contain an oxidase that can convert the purin bases into uric acid, and it is conceivable that the local precipitation of urate of soda may occur under the influence of some such ferment aided by the special state of the circulation in distal parts (hands, feet, ears), in tissues poorly supplied with blood (cartilage, tendon, fascia).

The manifestations of gout tend to diminish in old age, that is to say, attacks of true gout become rare, but goutiness is common, and old people suffer from various affections dependent upon the uric acid

dyscrasia, especially from calculus in the kidney and bladder and gouty cystitis. Gouty muscular pains and cramps are much complained of, especially in the spring; this is partly due to renewed attempts at exercise after the enforced confinement of the winter months. When the weather permits an old person to begin to get out of doors, the muscular pains which follow are severe, and it requires some patience and courage to persevere day after day until the unaccustomed muscles regain strength and lose their painfulness. This result may be aided by friction and passive movements, but, wherever possible, the habit of daily exercise should not be allowed to be given up. Where the patient cannot leave the house some form of exercise should be continued indoors.

If elderly patients follow the rules of hygiene, temperance in diet and regular exercise, they will suffer little if at all from "goutiness" and its various manifestations.

Emaciation

As old age advances there is usually loss of weight; the muscular masses become reduced in size, the bones grow thin and light, the glands atrophy, and the subcutaneous and abdominal fat shrinks. This is the effect of natural causes, and so long as it is a gradual process need cause no alarm, but rapid loss of weight in old age is highly suggestive of the onset of malignant disease, and may precede any other evidence of failing health. I met an old friend at dinner who seemed in his usual extremely good health and spirits, but I noticed that his collar seemed a good deal large for him; I had not seen him recently, so when speaking of this meeting to one of his relatives I referred to the evident wasting, as it was so marked,

but he only remarked that a man of seventy might be expected to " dry up," as he put it ; three months later our friend had to undergo an operation for cancerous stricture of the bowel. Another old friend whose evident loss of flesh struck me, in answer to my pointed inquiry as to his health assured me that he was feeling quite well, yet I never saw him again ; in a few months he developed obstruction of the bowels, and died after an operation which disclosed a large mass of cancer in the abdomen.

Emaciation may point to diabetes or to pulmonary tuberculosis, both conditions which may be present in old people without otherwise attracting special attention.

Obesity

The normal proportion of fat according to von Noorden is 130 grms. per kilo, or 13 per cent., so that if the normal weight is 12 stone the proportion of fat should be 21 lbs. If this limit is exceeded we may speak of it as obesity. The predisposition is undoubtedly often hereditary, but it may be induced by the use of alcohol, especially beer, by a sedentary life, and in women by the changes that accompany the menopause. It is often associated with gout, and gives rise to eczema and intertrigo. Elderly obese patients are frequently dull, and they suffer from somnolence especially after meals, from dyspnoea and palpitation, while uric acid sugar and albumen may be present in the urine. They show a lowered resistance to infectious disease, and, as a rule, do not live to extreme old age.

Obesity is explained by von Noorden as the " result of a long-continued disproportion between the amount of fat (?) consumed and that metabolised ";

this may be the result of (1) an increased food supply with diminished energy expenditure ; and (2) a combination of both conditions. The dependence of obesity on excessive intake of food long continued is not to be doubted, a small daily excess of 200 calories which may pass unnoticed would add 7·85 kilos (about a stone) of fat in the course of a year. Two ounces of white bread with a quarter of an ounce of butter would be sufficient to furnish this amount. It must be understood that this quantity produces obesity because it is an addition to the dietary that is sufficient to supply the demands of the body. In other cases, from want of exercise, less food is utilised and fat accumulates, while disinclination for physical exercise is often associated with increased indulgence in food, so that both factors combine to cause fat accumulation. Obesity of this kind is not abnormal, but is the consequence of an abnormal mode of living.

But there is a very generally accepted opinion that there are obese persons whose condition is at least to some extent dependent upon " constitutional tendency," and cannot be altered by regulated diet and exercise. It is attributed to a slowing of metabolism, and it has been sought to prove this by determining (*a*) the oxygen consumed, (*b*) the total daily exchange, (*c*) the dietary which serves to maintain or increase the body weight when continued over a long period. The first method has been tried in a series of individuals without pointing definitely to any reduced consumption of oxygen, but the cases were not chosen because they could not be reduced in weight by regulated diet and exercise. As cases of this type are relatively uncommon it is unlikely that most of the cases under observation were of this

type; but in the group of twenty-four investigated, three or four at least showed such a low consumption as to explain the tendency to obesity. Obese persons of weak constitution are not economical machines, the work accomplished by them representing only 11 per cent. of the calorific expenditure instead of the normal 25 per cent. The determination of the total exchange has been performed by Rubner, who compared the metabolism of two boys, brothers, one lean and the other fat, living under identical conditions; the results showed that the fat boy gave no indication that Rubner "could term diminished vital energy," his energy exchange was even greater than that of his lean brother, so that so far as they go these experiments give no support to the theory of "slowing of metabolism." The third method by determining the food has been applied in two cases by von Noorden, in two by Schwenkenbecher, and in one by Salomon. The weight was maintained or even increased on a dietary which was less than that usually regarded as required by such individuals. Thus a man of thirty-nine weighing 102 kilos (14½ stones) who took exercise freely in the open air lived for three months on a diet the calorific value of which never exceeded 1720 calories; at the end of this time he weighed 100 kilos. When it is remembered that the calorific value of a dietary for a man weighing 10 stone is 2450 heat units the case affords very striking confirmation of the popular belief. (See Appendix II. Nos. 7 and 8.)

The value of the thyroid gland in the treatment of obesity depends upon its power of stimulating the metabolic processes, while the tendency to corpulence observed in castrated men and women who have had their ovaries removed is explained by the reduction

of the total gas exchange observed by Loewy and Richter in dogs subjected to similar mutilation.

Further, von Noorden has shown that it is possible to reduce the calorific value of the diet in obese persons, and to obtain a loss of weight without any material increase of the nitrogen output.

Caro has recently stated that in all forms of obesity he has found a mononuclear leucocytosis affecting the middle and large mononuclears, but not the lymphocytes. The administration of thyroid extract was followed by an increase of the polynuclears at the expense of the mononuclears, exactly as has been observed by Kocher and others in the treatment of myxoedematous patients by this means.

The urine of obese persons often contains albumen, but this is probably connected with disorders of the heart and kidneys.

Glycosuria and Diabetes

Glycosuria, which is frequent in obesity, is usually attributed to excessive food and deficient muscular exercise, but in those cases in which weight is kept up on a diet of very low calorific value, the occurrence of sugar in the urine depends upon this constitutional tendency, and is not attributable to what in ordinary persons would be called either "excessive food" or "deficient muscular exercise."

Von Noorden is disposed to regard these cases with suspicion as potentially diabetic, but I have watched so many of them for years without observing this development that we are not justified in adopting so pessimistic an attitude. Obese people above all others need to obey the rule of strict moderation in diet, and of abstinence from alcohol; by so doing

they will live longer and escape many of the ills that are prone to plague the fatter portion of humanity; but I would not terrify them with the threat of developing diabetes. In Germany many cases are called diabetes and treated successfully by various methods institutional and otherwise which would in England be called glycosuria or "gouty glycosuria," and would receive little or no specific treatment to the greater pecuniary advantage and happiness of the persons concerned. It may be true that it is difficult to formulate a definition of diabetes that will not include such cases, but there is such a marked difference between them and the more or less rapidly fatal disease with which we are all familiar that there is a strong justification for the use of some less terrifying term in speaking of them to patients and their friends.

The kidneys are normally impermeable to sugar so that although the blood always contains traces of sugar the urine is free; a slight increase in the quantity of sugar in the blood does not lead to its excretion by the kidneys, but can be detected by analysis of the blood; when the blood sugar reaches 1·5 per mille it produces glycosuria.

This affords a striking contrast to the behaviour of urea to which the kidneys are normally permeable; increased production of urea never gives rise to excess in the blood, but is at once drained off by the kidneys, and this depurating process is only interfered with if the kidneys are seriously diseased.

The healthy kidney holds back sugar not because the sugar is present in too small a quantity, but because the normal renal epithelium possesses this power of which it may be deprived. This can be done by poisoning with phloridzin, less certainly with

caffeine, but in diabetes according to von Noorden there is no increased permeability, but rather is this function diminished, the quantity of sugar in the blood rising as high as 2 per mille or more, while theobromine and caffeine, although increasing the quantity of water, "do not influence the total quantity of sugar passed."

In many of the forms of glycosuria there is probably an incompetence of the glycogen reservoirs, especially of that main reservoir the liver. This may be transient or permanent, and is the consequence of some disturbance of function of the hepatic cells which may be toxic or nervous, or dependent upon the absence of some stimulus normally derived from the pancreas. It is singular that while the livers of diabetics and depancreatised animals have been found to be quite free from glycogen this substance is present in the muscles, renal epithelium and leucocytes. If the conversion of glucose into glycogen is the consequence of a specific agency it must be allowed that this is present in diabetes in those situations where normally it is absent, and therefore the failure of the liver to form and retain glycogen cannot be explained by the absence from the blood of the specific secretion of the pancreas. If the presence of an internal secretion of the pancreas is essential for the formation and storage of glycogen in the liver, why in its absence are other cells able to develop this power? It is no answer to this objection to say that the amount of glycogen so formed is small; the difficulty is to explain why these cells are able to take on a new power even to a small extent if the loss of the internal secretion of the pancreas prevents the liver in diabetes from forming and storing glycogen.

Apart from this question of glycogen storage von Noorden has shown that in diabetes there is an absolute incapacity of the cells of the body to utilise sugar; no doubt in mild cases the excretion of sugar may be diminished by exercise, yet this diminution is not in proportion to the heat produced, showing that not sugar but fat (or protein) has provided the material for combustion.

Moreover, not only is the combustion of sugar defective, but so also is the power of forming fat from carbohydrate, otherwise diabetics would grow fat. That there is such a condition of "diabetogenous obesity" no one can doubt; these are the obese people who from time to time show glycosuria, or in whom that condition may become permanent, but who do not lose their power of converting carbohydrate into fat. If they do lose this power they become ordinary cases of diabetes.

On the other hand, there is in diabetes not only such "over-production of sugar" as results from the cessation of glycogen formation and storage, but in severe cases sugar appears to be formed from protein and from fat.

In health sugar is destroyed by the tissues, and the catabolic defect must be looked for in them, and not in the blood. Cohnheim found that this "glycolytic" effect exists neither in the juice expressed from the pancreas nor in that from the muscles, but that when they are mixed together sugar "is broken up with great energy"; doubt has been thrown upon this teaching, and in spite of the universal belief that the pancreas stands in some special and intimate relation to diabetes, its exact nature has not been made clear. One of the hardest facts to co-ordinate is the occasional absence of the slightest trace of

pathological alteration in the gland, while the existence of only partial alteration in nearly all cases is unlike the experimental conditions where nothing short of the total extirpation of the gland is able to produce diabetes; it is plain that there is no proportion between the loss of the specific function and the structural change often met with in diabetes.

It must now be accepted as finally settled that the absorption of oxygen, the excretion of carbon dioxide, and the production of heat are the same in diabetes as in health. The diabetic requires as much food as a healthy man, but is unfortunately unable to utilise wholly the glucose derived from carbohydrate food, and must replace this by protein and fat.

Moreover, as already pointed out, the diabetic not only has lost the power of burning sugar, but also of converting sugar into fat and to a less extent of burning fat, for if it were not so a diabetic would be able to utilise his sugar by the roundabout way of first converting it into fat, and then using this fat to supply fuel for the body. That this does occur to some extent must be allowed, but in severe cases of diabetes, as already stated, the patient has lost the power not only of burning sugar, but of burning fat and of converting sugar into fat. Alonzo Taylor has suggested that the inability of the diabetic to convert sugar into fat may occur at the stage where butyric acid should be converted into a higher fatty acid, and that instead of this change taking place the butyric acid is oxidised to beta-oxybutyric acid, diacetic acid, and acetone.

Glycosuria is met with in elderly persons under varying conditions that need to be distinguished and defined.

They may be classified as (1) alimentary, (2) senile,

(3) hepatic, (4) nervous, and (5) diabetic—a classification which is of practical service if not scientifically accurate.

Alimentary glycosuria is usually met with in people over forty years of age, and becomes proportionately more common with advancing years. It rests on the fact that the power of utilising sugar undergoes a progressive diminution after the age of thirty, but this will not produce glycosuria unless either there is a natural or acquired limitation of the capacity for the combustion of sugar or the intake is excessive. The former condition exists in those who put on fat easily, so that obesity is the first stage and glycosuria the second in the defective catabolism of sugar. Clinical observation abundantly testifies to the truth of this statement, but it is a mistake to suppose that such cases necessarily in course of time become true diabetes. The very contrary is the case, and just as their pathogenesis is easily explained so their treatment is simple and sure. Mere abstinence from sugar, especially if this has been taken freely, may be sufficient; for example, glycosuria may follow the free use of sweet home-made ginger beer; but in any case the disappearance of the glycosuria will follow upon the reduction of the carbohydrate intake to those limits fixed by the catabolic capacity of the individual in question.

Senile glycosuria differs from the foregoing only in degree. It is, in fact, the failure to consume sugar that is met with in some very old persons; it is trifling in amount and devoid of symptoms, but occasionally gives rise to mistakes when discovered in the course of routine examination of the urine. Undue importance should not be attached to it. A

trace of sugar in the urine of a very old person has in itself no pathological significance, and may be safely disregarded.

Hepatic glycosuria is sometimes associated with the excessive use of alcohol, but in any case the liver is congested and probably enlarged. There may be slight jaundice or a subicteric tinge of the conjunctivae; this condition may depend upon a greater or less degree of heart failure following senile myocardial degeneration. The quantity of sugar may be relatively large, that is, there may be a high percentage present, but as the amount of urine is normal or less than normal the total amount of sugar excreted is always moderate, and never so great as to cause loss of weight. It is not a condition that calls for treatment by abstinence from carbohydrates, but by such rational means as are needed to deplete the liver, such as abstinence from alcohol, the use of a mercurial purge, heart tonics, and so forth.

Nervous glycosuria is met with in connection with senile neurasthenia, and with various disorders of the nerve centres. It may follow shock or an apoplectic seizure, and is comparable to the glycosuria which follows Claude Bernard's diabetic puncture. Like that it is transient, depending upon the discharge of the glycogen reservoirs, and is, as a rule, of no serious importance. Nevertheless, it should be watched and a guarded prognosis given until it has disappeared, but the treatment should be more or less expectant and any alteration in diet should be by limiting the quantity, and not by actual exclusion of sugar or starchy food.

Lastly, there is true **diabetes or diabetic glycosuria** which may make its first appearance after

middle life or even in old age, although it is milder in its course and more easily controlled than when it occurs at earlier periods of life. There is usually some degree of polyuria and thirst, but often not so much as to cause anxiety or drive the patient to seek medical advice. This is more often induced by pruritus of the genitalia caused by the irritation of torulae growing in the folds of the skin and setting up dermatitis. When the nature of the case has been thus brought to light there is generally evidence of some loss of weight, often amounting to a stone or a stone and a half, and careful inquiry will show that the condition has probably existed for a year or two. The urine in a considerable number of cases contains albumen as well as sugar, but not acetone or diacetic acid. If it contains acetone this points with some probability to alcoholic excess. It should never be forgotten that alcohol, especially in the form of champagne or beer, but also as whisky, may cause the temporary appearance of sugar in the urine as well as of acetone, and that this circumstance accounts for many cases of glycosuria otherwise difficult to explain, and also for some of the remarkable successes credited from time to time to various remedies for diabetes, which do not stand the test of wider trials. When albumen is present it should warn us not to attempt too strict a diet, as excess of protein may do even more harm than excess of carbohydrate. But excess in any form must be avoided, the use of vegetables and fruit containing small quantities of sugar and starch encouraged, purin-containing articles of food limited or forbidden (see Table), milk in moderation allowed, and at least one day a week set apart for a vegetarian regimen. Alcohol should be permitted with great caution, and only if justified by

careful trial in small quantities. Alkaline mineral waters are most useful in these cases, but if they are used at all they should be taken in adequate amount. For example, a bottle of Vichy water taken in divided doses through the day is a moderate allowance; less than this cannot do any good. The water is best taken about one hour or more before a meal, twice in the day, it may also be taken at meals.

Comparatively few cases of diabetes are unable to assimilate any carbohydrate, and this statement is especially applicable to the disease as it is met with in elderly people. Moreover, there is no advantage, but, on the contrary, considerable danger in depriving them of starchy food, for not only does an exclusive proteid-fat diet favour the occurrence of acidosis, but as many or most of these elderly diabetics have unsound kidneys it taxes the functions of organs that are already inadequate to the task demanded of them, and brings the patient within a measurable distance of uraemic poisoning. What is wanted in these cases is not abstinence but regulation of the quantity, and as we cannot expect that many patients will weigh their food daily it is convenient to be able to order the starchy food in some shape that dispenses with this necessity.

The French rolls made by Brusson Jeune, which can be obtained readily in this country, and keep good for months, contain about 500 grains of starch in each; Huntley and Palmer's "Breakfast" biscuits contain approximately 75 grains in each; a potato, the size of one's fist, contains about 400 grains; a pint of milk 400 grains (lactose). A dietary containing 1200 to 1500 grains of carbohydrate is a moderate one, and this quantity can be assimilated by many diabetics, but with such data as those just given it

is easy to order such a diet and increase or reduce the amount of carbohydrate according to the result. (See Appendix II. No. 5.)

Diabetes insipidus has been in modern times divided into three groups, the division being based on their etiology ; these are cases due :

1. To organic disease of the nervous system, especially of the medulla pons and cerebellum, most commonly of syphilitic origin ; but Cushing recognises some relation between the functional activity of the pituitary body and polyuria.

2. To a functional neurosis, where the polydipsia is primary.

3. To a renal defect, where the renal epithelium is incapable of secreting a concentrated urine.

In cases of the first type syphilitic remedies should have a prolonged trial, as in fairly recent cases the results are occasionally very good.

In those of the second type the patient should be treated in a hospital or nursing home, and the quantity of fluids allowed gradually reduced.

In the third, the diet must be regulated to the functional capacity of the kidneys. These organs should be tested by a diet containing a known quantity of NaCl and protein, which should be gradually reduced until it consists of salt-free carbohydrates and fats, on which the urine becomes diminished in quantity and more concentrated. The diet suggested by Talljquist and Meyer, to whose researches our knowledge of the type is mainly due, consists of potato purée 1000 grms., butter 100 grms., bread 150 grms., tea 500 c.c.

The capacity of the kidneys should be separately tested for salt and urea as they are not always equally obnoxious. Where the action of the renal epithelium

is defective theocin might be expected to do good; it may be administered in the form of theocin-sodium-acetate, dose 4 grains, well diluted in water after meals.

Alleged cures of the disease have been frequently published, valerian in the form of the fluid extract in drachm doses or valerianate of zinc up to 15 grains three times daily, liquid extract of ergot, ergotine (or ernutin B. W. & Co.), antipyrin, adrenalin, belladonna, a blister to the pit of the stomach and galvanism to the nape of the neck, have all been at various times found successful, but none has established a reputation as trustworthy. As in some cases death has occurred in uraemic coma and the kidneys have been found to be disorganised the amount of urea should be estimated in all cases, a precaution, the value of which will be appreciated if there is any question of giving opium or its alkaloids to diminish the polyuria or thirst.

Alcoholism

Old age confers a certain amount of immunity to the effects of **alcohol**, that is to say, the seasoned toper carries his liquor better, it interferes less with his stomach, his intellect, and his power of locomotion, but its poisonous effect on the structure of stomach, liver, kidney, heart, blood-vessels, and brain is cumulative, and as the result we have a whole series of chronic interstitial inflammations of these organs which are responsible for three-fourths of the diseases of old age.

Out of a total of 1490 persons, 862 males and 628 females who were returned in 1910 as dying from "alcoholism, delirium tremens," about 28 per cent. were

over fifty-five, these old drunkards being absolutely and proportionately more numerous among men, but of those over seventy-five there were 19 women to 8 men. If we turn to the tables of deaths per million living the males are 50 to the females 34. The table showing the mortality per million living from this cause in each quinquenium since 1875 is not altogether satisfactory, for although there has been a steady fall since 1895 the figures stand in 1910 at 54·6 against 48·2 in 1885, and 42·4 in 1880.

If a man drink to such excess as to be seen about the streets intoxicated, there is no secret about the matter, but there are many individuals of both sexes who drink to intoxication, but are so careful that few if any people know of the habit, and under these circumstances the real cause of any symptoms from which they suffer may be overlooked ; this is especially likely to be the case in alcoholic glycosuria, alcoholic gastritis, and alcoholic neuritis.

It is certainly strange that it should be possible for a husband to live with a drinking wife, and yet not detect it, but these cases happen. In one case known to me the husband was a medical practitioner in good circumstances, but not so much occupied as to see little of his home ; he told me that he was called out one night in consultation with a neighbour, and on their return together they went into his room where they sat talking rather late. The house was quiet, and every one supposed to be in bed, so that a noise on the stairs drew them out to see the cause ; they found his wife so drunk that she had fallen on the stairs, and they carried her to bed. Up to that night the husband had suspected nothing, but on inquiry he found that the habit had existed for years, yet he was almost an abstainer, of quiet habits,

by no means unobservant in his profession, although this had been going on for years under his nose. It is rather remarkable that this same man published a paper on the use of the nose in diagnosis, and evidently possessed a sense of smell more acute than that of most people. In another case the husband was a rough sportsman who took a good deal of alcohol himself, but when he was told that his wife's illness was due to drinking he refused to believe it, saying that he knew what drink came into the house and who had it, yet on inquiry he found that she had been for years buying brandy of which he knew nothing. They were young married people sharing the same bed, yet the husband had certainly no suspicion of his wife's habit. There are men who drink only late at night, who go to bed full of alcohol, but are able to get up early in the morning and do their work without discredit. When we read of the social habits of a hundred years ago we wonder that any efficient work was done, and we have to admit that large potations are not inconsistent with the performance of the highest kind of work. The account Gibbon gives of the quantity of Madeira he consumed may explain why he died at fifty-seven, but not his production of one of the great masterpieces of history. He died from gangrenous inflammation of what was thought to be a hydrocele, but was a hernial sac which was filled with ascitic fluid probably caused by cirrhosis of the liver. No hydrocele would have discharged "four quarts" of fluid, but although the body was opened, and the existence of the hernia was proved, there is no note of the condition of the liver.

The effect of alcohol varies in different subjects, and however clearly we may recognise the harm it

does we must admit that its use even in large quantities is not inconsistent with efficient work. We may believe that the man who drinks much injures his health and shortens his life, but is necessarily neither imbecile nor impotent. Bismarck is a good modern example of a man who was great as a worker, but great also as an eater and a drinker, yet who lived to be eighty-three.

One of the signs of latent alcoholism is glycosuria; it is unfortunately not only overlooked but denied in several authoritative text-books, the consequences being that many cases of supposed "diabetes" are "cured" by a variety of remedies, and an altogether false clinical picture of "diabetes" is left on the mind of those who have encountered these cases without recognising them. As the glycosuria so induced disappears so soon as the alcohol is stopped or reduced in quantity, it must not be expected to be found in cases of chronic alcoholism seen in the wards of hospitals or workhouses where they can get no drink, but it can be easily demonstrated in the outpatient department.

Chronic alcoholism causes general depression of the circulation; the nose and ears are cyanosed, the capillaries of the face generally dilated. Locomotion is difficult, the hands tremble and the handwriting shows it. After a dose of alcohol there is some temporary improvement, the hands are steadier and the patient feels stronger, but the effect lasts only a short time; the dose is repeated and increased until acute alcoholism or delirium tremens may develop. The most common cause of delirium tremens is shock in an alcoholic person; it is very common in fracture of the leg; it is probable too that pneumonia is a cause, as in quite a large proportion of cases pneumonia

is present, and it is more likely that the pneumonia causes the delirium than that the delirium causes the pneumonia. But there are cases in which neither of these is present, and we can assign no other origin but acute alcoholism in a person who has injured his brain by chronic abuse of the poison. No one gets delirium tremens from a first dose, however large, though they may become comatose and even die. The acute delirium of chronic alcoholism is preceded by hallucinations of vision which the patient recognises to be hallucinations; he sees mice or rats, or blackbeetles, but never in the centre of the field of vision, always at the periphery so that they disappear when he looks at them. At first they amuse him, then annoy him, and finally excite and terrify him. In the last stage he becomes violent, noisy, and loses control over himself, but he is not really dangerous, and if spoken to firmly will give in although he may begin again the next minute.

Mechanical restraint may be beneficial and necessary so long as it does not supersede proper examination; no one would like to think of a case of pneumonia being tied up in a strait-waistcoat. It is because mechanical restraint is so easy that it has got a bad name, for it too often means neglect; but it is far better to tie a patient in bed than have him running about the room or perhaps getting out of the room or house. A folded sheet tied or fastened with safety pins may make a most efficient restraint.

It is, however, usual and advisable to calm the patient by drugs, as if we can induce sleep the case is generally cured. The best of all drugs is chloral. Order two drachms with two drachms of tincture of digitalis in six ounces of water, one ounce to be given every hour until sleep is induced. If the whole

bottle is taken without effect it should not be repeated until an interval of six hours has elapsed.

Beef-tea is the best food, if food it can be called; it stimulates and makes no demand on the digestive organs.

Heroic doses of chloral are sometimes given with good results. I saw a case of delirium tremens in consultation with the doctor to a hotel, and prescribed two drachms of chloral as above; the patient was soon after taken in charge by his family doctor who mistook the instructions and gave the whole quantity at once; the patient slept for twelve hours, woke up quite well and went home.

No alcohol should be given to persons suffering from alcoholic poisoning. It is absurd to do so, yet is often done. If stimulants are needed, digitalis or digitaline, nux vomica, or strychnine, camphor, coffee, or caffeine should be employed.

Camphorated oil in sterilised 5 c.c. capsules, containing each one gramme of camphor should be used by hypodermic injection, the dose being repeated every six or eight hours according to circumstances.

Chronic alcoholic indulgence may induce indisposition to work, indifference to the calls of duty or disregard of social obligations; it impairs memory, weakens the power of concentration and of judgment, in some cases this downward progress ending in partial but permanent dementia. The face is cyanosed, the extremities cold, the grasp weak, the gait reduced to a shuffle, digestion is feeble, the bowels are constipated, and there is no desire for food. When this stage is reached cessation of drink usually follows, but the general health in spite of this and of careful nursing does not improve, although the

enfeebled patient usually dies from some intercurrent disease, and not directly from the effects of alcohol.

The effect of alcohol on the skin is familiar in the acne rosacea of old drunkards; these subjects also are predisposed to eczema, to prurigo, pruritus, and to erythema and erysipelas, to seborrhoea of the scalp, boils, and carbuncles. In association with alcoholic neuritis there is localised sweating, and a papular rash due to hyperaemia of the sweat glands.

For the treatment of alcoholism there is only one remedy, abstinence from the poison. There should be no "tailing off," no gradual reduction of the dose. On the other hand, cure should not be attempted unless the patient is under control in an institution of some sort, and if there is debility the course should be begun in bed.

If the patient takes his food well there need be no anxiety as to the result and no medicines are needed. Where the stomach is out of order the gastritis must be cured by suitable diet and medicine, for which the reader is referred to that part of this book. If the heart is weak, beef-tea, caffein, coffee, digitalis, or digitaline, strophanthus, nux vomica, or strychnine should be given, tobacco should be forbidden, and rest in bed enjoined. As a rule, after abstinence for a few days the craving for alcohol disappears, and it is doubtful whether the alleged remedies so much used in advertised cures have any effect except on the imagination. But of these atropine seems to have most evidence in its favour, and there can be no objection to the administration of $\frac{1}{100}$th of a grain two or three times a day in pill or mixture.

CHAPTER X

General Infectious Diseases

Influenza—Typhoid Fever—Erysipelas—Whooping Cough—Tuberculosis—Infective Arthritis—Syphilis—Gonorrhoea.

Old persons are undoubtedly to a very great extent immune from infections, this immunity being partly acquired from previous attacks and partly the result of senile changes in the chemical constitution of the fluids and solids of the body. Experiments on animals show that the old have diminished receptivity but less resisting power. They are prone to two infections which are not seldom fatal; these are pneumonia and cystitis, but these are dealt with respectively under respiratory and urinary diseases. Influenza occurs less frequently in old age, but is highly dangerous, and even where the initial attack is not fatal it may cause asthenia so serious that death occurs shortly afterwards. Erysipelas is common in consequence of the extreme vulnerability of the skin in old age. Typhoid fever attacks the aged occasionally, but generally runs a mild course. A few other infections are also briefly noted in this chapter.

Among the causes of lowered resistance to infectious diseases in old age obesity should not be overlooked.

Influenza is a disease for which old age affords

only partial immunity, and in the pandemic of twenty years ago there was not only a large amount of illness, but a serious mortality among elderly persons from this cause. The chief danger is from attacks of the respiratory type, which are so liable to be complicated with pneumonia in advanced life, but there are none of the complications of this protean disease which may not occur, although they are happily more rare.

Influenza is dangerous to old people in consequence of its proneness to attack the myocardium, the lungs, and the kidneys, organs which are seldom sound in advanced life.

A senile myocardium which might perform its work for years succumbs rapidly to the effects of the influenzal toxins, and in many cases an attack of influenza has been the beginning of signs of myocardial degeneration in an elderly person who up to that time had had no reason to suspect that his heart was not perfectly sound. Those who are old enough to have been in practice for some years before 1890 can hardly fail to recognize the much greater frequency of non-valvular heart disease since that date, of which the symptoms are at first irregular and intermittent pulse with general complaints of weakness or of inability to walk as formerly, shakiness of the legs, less commonly pain at the heart; during this stage there is no murmur, and the apex beat is not displaced. Apparently complete recovery takes place and may be permanent, but relapses are liable to occur, whether from reinfection or not it is difficult to say, as the disease is so common and its attacks vary so much in character, often assuming the form of a common cold or sore throat. Later on the apex beat becomes displaced, and with the development

of dilatation the case becomes more serious, although here again the ventricle may contract and another period of fair health ensue; but in course of time definite cardiac failure sets in, as shown by oedema of the lower extremities, and runs a slowly progressive course to a fatal termination, though this may be postponed, by suitable care and remedies, for many months.

The risk of pneumonia in elderly persons suffering from influenza is very real. It may often occur only when convalescence from the original attack has allayed anxiety and the patient exposes himself by going out of doors or resuming his occupation. It is easy to be wise after the event and to talk of imprudence, but it is very difficult to decide when the liability to such accidents has ceased, and often impracticable to prevent the bread-winner of a family returning to work when there is no sign of fever and at most he complains only of being easily tired, a symptom which persists for a long time after an attack of influenza. We can only regard with increased anxiety all cases of influenza in persons over sixty, and whenever possible prescribe a longer period of rest and care before sanctioning a return to the ordinary duties of life.

The effect of the toxins on already existing renal disease may be to determine a fatal result during the attack of influenza, the patient becoming delirious and dying comatose. When the results are not immediately fatal the toxaemia may bring out a previously latent nephritis and start a succession of symptoms that ends fatally after some time. Cystitis in the same way is very liable to be aggravated, or a previously dormant condition to become sub-acute, but rest and appropriate remedies may here prove

effectual, and the compulsory prolongation of the treatment in bed is not altogether a disadvantage; the legacy of the disease is too often a more irritable bladder and a greater liability to more or less severe recurrence of cystitis.

A frequent sequel to influenza is gastritis, which is all the more likely to occur where the gastric mucous membrane is already the seat of old standing inflammatory disturbance. It is common to meet with cases in which the patient dates all his more serious digestive trouble from an attack of influenza.

Diabetes is also liable to be unfavourably influenced by this disease, or may be the factor that determines a fatal result, the patient dying of diabetic coma.

The chief lesson that experience has taught us is the need for care, the unwisdom of neglecting the initial attack or of returning too soon to work or one's ordinary mode of life. Rest, equable temperature, and simple diet will see most people safely through an attack of influenza, but mischief arises from unwillingness to lie by, undue haste to get up again, and exposure to our treacherous climatic influences when under the influence of the influenza toxins.

Of all the drugs that have been tried none has proved a specific or capable of interfering with the course of the disease. Antipyrin or Salipyrin has been found useful to relieve the pains in the back and limbs, the effervescing citrate of caffeine and phenacetin (B.P.C.) soothes the headache, quinine, especially the ammoniated tincture, helps during convalescence, but each complication requires special treatment. Change of air often works a wonderful improvement if not sought too soon; the disease takes time, and if the patient is allowed to go away in less than three

or four weeks after the onset there will probably be a relapse and a period of renewed illness under the relative disadvantages of absence from home.

Stimulants are often necessary during convalescence, even for those who habitually take no alcohol. A tumbler of egg-flip or rum and milk at eleven o'clock in the morning is useful, especially where appetite has not returned and too little food is being taken.

Typhoid Fever is sometimes met with in the aged. Its course is usually mild, its symptoms inconstant, the rash often absent, the spleen not enlarged; there may be no diarrhoea, but there is marked prostration, with cardiac enfeeblement and impaired digestion; convalescence is slow. In 1910 the average death-rate per million living at all ages was 53, the disease being rather more prevalent in males than in females. The highest mortality was during the age decades 35 to 45, when it was 78, while in the three succeeding age decades it fell to 58, 45, and 22. If we compare the deaths from enteric fever after 45 with the total at all ages we find that they amount to only 17 per cent., and those after 55 to only 7 per cent. It therefore seems improbable that Griesinger's estimate of the mortality after sixty years of age as 33 per cent. should give an accurate impression, but there are such great variations in the death-rate from this disease that it is impossible to deduce the probable risk from statistics alone. Murchison gave the death-rate at the London Fever Hospital as 15 per cent., and this agrees roughly with my experience of hospital mortality in non-epidemic times, when the number of cases is small and those seen are mostly of a severe type, yet in epidemic times the hospital mortality sinks to about 10 per cent. and the general mortality to 7·5 per cent., as seen in the great Maidstone

epidemic, when over fifteen hundred cases were treated in all sorts of ways by doctors of varying skill and experience and under very diverse conditions of age, social conditions, nursing and general surroundings. It is for this reason that it is impossible to attach serious importance to the comparative results of therapeutic experiments such as those upon which it has been sought to try the cold-bath treatment. All infectious diseases may differ enormously in their virulence, and inexperience is constantly attributing to a method of treatment good results that in reality should be ascribed to the mildness of the prevailing epidemic. Moreover, epidemics constantly diminish in virulence in course of time, so that a remedy or method introduced during an epidemic meets with increasing success and thus earns an altogether undeserved, or at least a disproportionate, reputation which lasts until it is tested in the next severe outbreak of the disease. For these reasons I am unconvinced of the utility of the cold-bath treatment of typhoid fever, and as it imposes much additional work on the nursing staff, and cold sponging is quite effective in reducing the temperature, I have not included it in the following notes of the means to be employed.

The management of a case of typhoid fever in the aged does not differ in essentials from that of the disease in adult life. As then good nursing is the most important means to promote recovery, and this implies the presence of trained nurses, one for the day and another for the night. Wherever possible relatives should not be allowed to nurse typhoid cases, as they know neither what to do for the patient nor how to preserve themselves from the risk of infection. A typhoid nurse cannot be improvised, for

those who have hospital experience in the training of nurses see many instances of the difficulty of getting quite intelligent probationers to follow out the rules which are essential to the welfare of the patients and themselves.

The essentials are absolute rest in bed on a hair mattress in a small bedstead, $3\frac{1}{2}$ to 4 feet wide, with a drawsheet under the patient and at most a single blanket and sheet as covering. The patient should be kept scrupulously clean and sponged with cold water when the temperature goes over 102° F. This sponging of one limb at a time should not be made fatiguing to the patient, but should be pleasant, while by checking pyrexia it maintains his strength. The stools and urine should be disinfected by 2 per cent. formalin solution or 5 per cent. carbolic acid solution, or where as in a hospital large quantities are required and expense is a consideration by the use of chloros in 1 per cent. solution. Chloros can be obtained from the United Alkali Company of Gaskell Deacon Works, Widnes. These solutions must be used freely, and in addition all bed and body linen removed from the patient should be steeped in one or the other (preferably the last, as not injuring the material), and a bowl of solution kept by the bedside in which the nurse and doctor should disinfect their hands after handling the patient.

The diet should consist of three pints of milk in twenty-four hours diluted with equal parts of barley water, or, if there is diarrhoea, with lime water. It is not worth while to try experiments with feeding, as they involve some risk, while the milk is sufficient; if it disagrees whey should be substituted for it. Frequent feeding of the patient is necessary, and this as a rule only a trained nurse manages properly.

Stimulants should not be given until some occasion arises, but may be needed in the third and fourth week, when a teaspoonful of brandy or whisky every hour should be given in water or soda water, but not in milk, as the taste may set the patient against the milk.

When it is desired to increase the diet one or two eggs beaten up with milk may be added, afterwards arrowroot or other bland, starchy food. Solid food should not be given until the temperature has been normal for fourteen days.

When the stools are liquid, large, and more in number than two in twenty-four hours, ten grains of Dover's powder should be given after each stool, by which means the diarrhoea may be held in check. When the bowels do not act of themselves a simple enema should be given every other day.

The mouth should be cleaned daily with lint soaked in a solution of carbolic acid and glycerine; one ounce of glycerine and carbolic acid to eight ounces of rose-water.

There is no specific remedy for this disease, but as a harmless mixture which disinfects the mouth sulphurous acid 15 minims in an ounce of water may be given every four hours.

Sleeplessness is a somewhat common trouble in old persons suffering from this fever, and the most efficient remedy is chloral; fifteen or twenty grains of chloral with fifteen minims of tincture of digitalis in an ounce of water, the dose to be repeated in four hours if required. This mixture may also be used where there is delirium.

Haemorrhage from the bowel in the early stages of the fever calls for no treatment, but in the third or fourth week it is best to give the third of a grain of

morphine hypodermically, put an ice-bag on the abdomen, and substitute whey for milk, or reduce the milk by half for the ensuing forty-eight hours.

Erysipelas is one of the most common of the infectious diseases occurring in persons over sixty years of age. From a recent study of the disease in old people undertaken by Pierre Lamy upon the aged inmates of the Maison Départmentale at Nanterre under the care of Dr. Oppenheim, we learn that the infection is often secondary to some lesion of the skin, often manifest to the naked eye and frequently of parasitic origin. It appears to attack women more often than men, as of his thirty cases only six were in the male sex. There should be no doubt of the frequency of the disease in persons above sixty years of age, and this is probably dependent upon the greater vulnerability of the skin in advanced life. In twelve of his thirty cases the lesions were due to phthiriasis, and in nineteen in all there were obvious breaches of surface affording channels for the introduction of infectious material. In aged persons gathered together in such an asylum as the Maison de Nanterre contagion plays a not unimportant part, and was actually the cause of three of the thirty cases.

As is now well known, erysipelas is caused by the infection of the skin by virulent streptococci. These organisms have been found in the skin and mucous surfaces of healthy persons where they seem innocuous, but if associated with the bacillus coli they become virulent and may give rise to erysipelas, suppuration, septicaemia, and ulcerative endocarditis. According to Dr. Lamy's experience, erysipelas in the aged develops feebly, lasts a long time, and presents all its symptoms in an attenuated form. He observed no association between it and pneumonia,

but these two conditions may occur together; and Widal has described a form of pneumonia insidious in its onset and occurring in multiple foci, apparently due to a mixed infection of pneumococci and streptococci. The lesion in the skin of the aged is less intensely red, less hot, less raised above the surrounding surface, and less painful, while there is a remarkable absence of general symptoms, and the leucocytosis is less intense than in the adult. These modifications depend, according to Dr. Lamy, on sclerosis of the skin, and upon the consequent atrophy and disappearance of cutaneous blood-vessels, lymphatics, and nerves.

Instead of a sudden onset with rigor, fever, and swollen glands, these cases exceptionally begin with headache, lumbar pain, loss of appetite, and epigastric pain, occasionally with bronchitis or a patch of bronchopneumonia; but, as a rule, neither rigor, fever, nor swollen glands appears before the patch of dermatitis; the fever and the dermatitis occur together in most cases, occasionally the fever does not show itself until later, and at times does not appear at all. In none of Dr. Lamy's cases was there any delirium, while albuminuria was absent in eighteen, was temporarily present in four, and in eight had existed before the attack. The most common complication was a patch of pulmonary congestion in one or both lungs observed in six cases, in one preceding all other symptoms, and in the other five developing in the first few days of the illness. The most frequent type of temperature curve was a sudden ascent followed by lysis without any fastigium, and even falling more rapidly than is usual in lysis. In the only fatal case the fall was followed by subnormal temperature for the last thirty-six hours of

the patient's life, but in none of the other cases did this hypothermia occur, so that it may be regarded as of grave omen. The duration of the fever was from two to five days, but in two it lasted eight days; in one of these, the fatal case, it was high and irregular.

In migratory erysipelas there may be a prolonged series of temperature curves. In relapsing cases the fever during the relapse is generally less severe and shorter than in the original attack.

In recent years the examination of the blood has shown that there is generally some reduction in the number of red cells, with a marked leucocytosis affecting the polynuclears, while the mononuclears are diminished. As convalescence sets in the polynuclears diminish in number, while the mononuclears increase; if the case gets worse the leucocytosis increases, and so long as it is present the infection persists. In the aged this leucocytosis is absent or slight, as in Lamy's cases; in none did it reach 15,000, in eight it was absent, and in only six was it over 10,000.

Of the local complication, although bullae are rare, suppurations are the most frequent, but were absent from all these cases; gangrene has been observed, and is likely enough in debilitated subjects, or patients suffering from diabetes or Bright's disease. Sore throat, otitis media, conjunctivitis, and dacryocystitis may occur, and in one of Lamy's cases there was suppuration of both lachrymal sacs, with consequent formation of fistulas. The most common complication was consecutive sclerosis of the skin of the face, the thickening being accompanied by persistent redness without heat; the lymph taken locally contained no streptococci, but the toxins formed

locally produce vaso-dilatation, and may re-awaken old skin troubles in other parts of the body.

Difficulties of diagnosis may arise from the mildness of the symptoms, and the most frequent confusion is with dental abscess or acute eczema; in old people there is the special risk of confounding it with lymphangitis around a wound or old ulcer, but in this condition there is less fever, it is more stationary, and tends to recur so long as the original wound persists.

For distinguishing between relapses and the persistent red sclerosis already described, we must look for leucocytosis.

It is generally supposed that erysipelas in old persons is a fatal disease, death being due to the failure of one or other important organ, but in this series of cases with a mortality of one only out of a total of thirty there was little to support this view. The patient who died had chronic heart and renal disease, but several that recovered were suffering from similar conditions.

The mortality has been estimated at 20 per cent., but in this series it was only 3·33 per cent., and recoveries have been observed in very old people, so that age in itself is only a secondary factor.

It is probable that the gravity of the prognosis depends mainly upon the virulence of the infection, and that Lamy had to do with a benign form of the disease. The state of the heart and kidneys must always be taken into account, but these records show that they are not always fatal; of the twenty-nine that recovered one had mitral disease, two chronic myocarditis, two aortic insufficiency with renal disease. Four other patients had signs of organic brain disease; all had arterio-sclerosis and high

blood pressure. Lamy regards chronic intoxication by alcohol, morphine, or lead, and the association of erysipelas, with another infection, such as typhoid fever or advanced tuberculosis, as the most unfavourable conditions for recovery.

THE TREATMENT of erysipelas may be divided into local and constitutional. The local method generally employed is to put on some sort of dressing, either dry or wet, generally a layer of cotton wool secured by a bandage, but this is one of the conditions in which the principle of excluding the ultra-violet rays should be borne in mind. This may be done by interposing a layer of red calico in any dressing, or by painting the patch with a weak gutta-percha film coloured with carmine or lamp black—tincture of cochineal 1 part, solution of gutta-percha 4 parts, or lamp black 1 part, solution of gutta-percha 9 parts. It is probable that the plan formerly employed by some practitioners of painting the surface with the tincture of perchloride of iron owed any efficacy it possessed to this principle. Painting the margins of the patch with a broad band of tincture of iodine is rational. Internally, the use of large doses of the tincture of the perchloride of iron has had many supporters, fifteen or twenty drops well diluted with water every four hours. The patient should be kept in bed and protected from changes of temperature. The diet should be light and stimulating, containing a pint of good strong beef-tea daily, with the addition of ½ lb. of bread, 1 oz. of butter, one or two eggs, 2 pints of milk in part in tea or coffee, partly in bread and milk, or milk puddings with stewed fruit and vegetable purées.

All his patients were treated by Lamy with intravenous injections of colloid solutions of electrargol,

a French preparation of colloidal silver made by passing a current of electricity through distilled water by means of silver electrodes; it is supposed to have a specific effect upon streptococci and is supplied in sterules containing 10 and 20 c.c. The dose employed was 10 to 15 c.c. daily, regulated by the temperature and given for several days in succession. In twenty cases the temperature fell after the injections, in four no modification resulted, in six there was an immediate temporary rise of temperature. In no case was there any accident or any unfavourable effect on the course of the disease, but in two it did not appear to have any beneficial result. The chief result claimed for this treatment is that the duration of the disease is shortened. Vaccines of the streptococcus have been made and used successfully in the vaccine department of St. Mary's Hospital.

Cases of **Whooping Cough** occasionally occur in old age and are very distressing. Hale White has recorded an instance of a woman aged eighty-one; Todd of a man aged eighty; the wife of the latter patient also suffered at the same time, her age being sixty-two. The cough differs from that of childhood in there being no "whoop," and Rauzier suggests that the wider glottis of old persons explains this difference. It is always a cause of anxiety, as the attacks of coughing induce exhaustion and may set up emphysema, dilated heart, and vomiting, but all the cases recorded have recovered. The recent report of the vaccine department of St. Mary's Hospital refers to efforts that have been made at that institution to treat whooping cough by vaccines and also to render uninfected children immune, but up to the present both the preventive and the curative methods are *sub judice*.

Tuberculosis, although an infective disease, has been discussed under diseases of the Respiratory System, and its other manifestations, which are relatively rare and do not differ materially when they occur in old age from those met with in adult life, need not detain us. **Infective arthritis**, including that due to tubercle, is generally mono- or oligo-articular, fixed and obstinate in its localisation and rebellious to treatment by salicylate salts.

Primary syphilis in old age is rare, but does not differ from that seen at other times of life. It is likely to have a more disastrous effect on the general health than when it attacks a vigorous constitution unaffected by decay, but its management should follow the usual lines. Such a case is eminently suitable for the systematic course of treatment carried out at Aix la Chapelle. A surgical colleague, when approaching his seventieth year, became infected in the course of his professional work; in spite of careful treatment, he aged rapidly and died in the course of two or three years, not from any definite syphilitic lesion, but from constitutional shock.

The incubation period is often prolonged, lasting from five to six weeks, and the primary sore is especially liable to become phagadenic in consequence of the vulnerability of the skin of old persons to pyogenic infections. The eruptions are apt to be severe, persistent, and to relapse; the palms of the hands and soles of the feet are often affected; interdigital mucous patches are frequently seen; anaemia is marked, and there may be fever.

The tertiary symptoms appear early; both gummata and nerve lesions.

The prognosis should be guarded.

Diagnosis is rendered difficult by the desire of the patient to conceal the truth, and by the age of the patient diverting suspicion from the real cause of his symptoms. When Hebra was on a visit to London nearly fifty years ago, he was consulted about the case of an old general whose skin eruption had baffled the diagnostic skill of his medical advisers; after a brief inspection of the rash, he shocked and surprised these gentlemen by his blunt announcement of its syphilitic nature, to which they had been blinded as much by respect for their venerable patient as by ignorance of the disease.

The gravity of failing to recognise the disease is all the greater, as, if untreated, it is almost always fatal.

Gonorrhoea, when it occurs, is apt to be troublesome, and although the acute attack may be expected to yield to appropriate remedies, complete recovery is slow and difficult, relapse not uncommon, while cystitis is a probable sequel and a persistent gleet may remain. It is important to insist upon rest with simple diet and abstinence from alcohol; the mineral waters of Vichy, Vittel, Contrèxeville, or Evian should be taken freely, and 10 or 15 minims of oil of red sandalwood may be given in capsules three times after food so long as this remedy does not disturb the digestion. Santyl (Merck) is a derivation of sandalwood oil; it is recommended on account of its comparative freedom from taste and the absence of any irritating effect on the stomach. It is administered in doses of twenty-five drops in water three times a day after food, or may be prescribed in capsules.

Vaccines are recommended for use in acute and chronic gonorrhoeal arthritis as well as in gonorrhoeal arthritis and septicaemia (Allen).

CHAPTER XI

Regimen, Dietary and General Treatment

Insomnia—Exercise and Fresh Air—Clothing—Baths—Massage —Drugs—Opotherapy—Diet—Special Dietaries.

Something has been said in the preceding chapters on these subjects in relation to various incidental diseases and departures from health, but it may be convenient to gather together in one place a good deal that is otherwise scattered through this volume, and add such matter as has not previously found a place.

Insomnia.—Old people often complain of insomnia. They get off to sleep all right but after five or six hours they wake and do not sleep again, or only doze a little. They are ready to get up when they are called, if they are in fairly good health, hence the old Duke of Wellington's dictum " when you turn in bed, turn out." But most do not turn out, because they do not wish to disturb the housemaid by their presence when she is cleaning the grates and flapping her dusters in the empty rooms; and they do not care to go out in the early mornings unless it is fine; while if they stay in their bedrooms they are better off in bed with a book. After all, the old do well enough with five or six hours' sleep as they feel fresh during the day, even though in earlier life they slept long and late when they could and after a short

night's sleep were more or less tired all day; this is one of the compensations of old age. Old people, possibly because they take things quietly, do not suffer much from the sensation of fatigue; they are able to endure for as long as younger people, when they go at their own pace; probably because they produce less fatigue toxins, and perhaps it is for this reason that they sleep less and do not perceive any ill effects from doing so.

But in those cases where the patient cannot get to sleep, or after sleeping for a couple of hours wakes and is restless, treatment is required.

The first form in which sleep does not come at all or only after some hours of waiting is **nervous insomnia.** It may be toxic from tea, coffee, or tobacco, and inquiry should be made into the habits with regard to these things; the quantity should be reduced or their use forbidden in the evening or altogether. In other cases we should try a little hot food, such as bread and milk, or cocoa and a rusk, or arrowroot, or a small quantity of stimulant such as a tablespoonful of whisky in hot water taken just before going to bed, or in the case of feeble persons who are exhausted by the effort of getting undressed, after they are in bed. In some it is necessary to give, or pretend to give, a drug; simple camphor water used to make one old man sleep, and he always used to tell me how bad it had made him feel the next day! A very simple remedy is twenty grains of bicarbonate of soda in an ounce of peppermint water which may act by suggestion, but also quite possibly neutralises any sour mucus there may be in the stomach. Of the true hypnotics one of the most harmless is trional, and where a five grain tablet acts, as it often does, it may be permitted as a regular

thing, although it is doubtful whether it acts otherwise than by suggestion.

Cold feet often keep old people awake, but can be prevented by wearing lambswool socks, using a hot water bottle and wrapping a small blanket round the limbs.

In HEART DISEASE insomnia is frequently very troublesome, and a succession of remedies has been supplied from German pharmaceutical laboratories for its treatment. Of these a seven grain tablet of veronal is the most trustworthy ; it should be crushed in a little hot water and taken on going to bed. Its use may be continued indefinitely without harm, so long as the dose is not increased.

In serious heart disease a hypodermic injection of a third of a grain of morphia is very certain and safe, but should be used with circumspection and its administration kept in the hands of the medical attendant.

When the patient goes to sleep quickly but wakes in a couple of hours and is restless, the cause is INDIGESTION, and the evening meal should be regulated, any cause removed ; a bismuth and soda mixture (Appendix I., No. 5) may be given before meals and at bedtime, or half a pint of hot water with a teaspoonful of bicarbonate of soda dissolved in it, sipped slowly before going to bed. If the tongue is coated a single five grain blue pill should be ordered, and the diet and treatment for gastritis instituted.

Exercise and Fresh Air.—The aged easily get into indolent habits, and should be induced whenever possible to take regular exercise, which should be moderate in amount. Bad weather is too often made an excuse for not taking exercise, and at times may really enforce staying in the house ; but if the habit

of regular exercise is maintained and slight variations of weather are not allowed to interfere with it, they will gain in return a large amount of immunity to colds and be able to endure changes of weather without discomfort.

On those days when it is impossible to get out of doors some form of chamber exercises may be used with advantage. It is not necessary or desirable to use heavy weights or to make violent exertion, but it is well to flex and extend all the joints, to rotate the body and head and so to contract all the muscles. Twenty minutes of such movements as are described in Appendix VI. will do much to keep the body in health.

The best time for exercise is in the morning, and on returning home some slight refreshment should be taken such as a cup of soup or an egg beaten up with milk.

It is, perhaps, less necessary to insist on the advantage of fresh air than it was a very few years ago as the cult of open windows has made marvellous progress, but the aged are conservative, and less influenced by new movements. They should avoid late hours and hot rooms, and should accustom themselves to sitting with open windows or out of doors. When confinement to the house becomes necessary they should not be allowed to remain during the day in the same room they have occupied at night, which should be thoroughly aired. To carry out these principles may be difficult on account of their prejudices, as it would be unwise or even cruel not to accord some privilege to inveterate habit; but an attempt may be made in the warmest part of the year to begin the plan of widely opened windows, and this may be kept up as long as possible. There

is all the difference in the world for the comfort of the inmates between a window widely open and one opened a few inches, and when this fact is appreciated the battle in favour of open windows is half won.

Clothing.—The *underclothing* of the aged should be light and warm and of some woollen material. So many unirritating light woollen fabrics are now available that there is plenty of choice and no difficulty in suiting each person's taste and requirements, but where there is a decided objection silk may be worn next the skin and a woollen garment over that. All clothing should be loose and soft without stiffened bands or linings. Corsets are, without doubt, irrational from the point of view of hygiene, and inartistic, but they afford support, and muscles that have been so long weakened by their means cannot easily be educated to resume their proper functions, nor is old age the best period at which to attempt it, so that we should not create unnecessary difficulties by attempting too radical a reform. Thin persons may be able to dispense with them more easily than stout individuals who can ill afford to dispense with their bracing help. But, as has been pointed out many times, the skin in old age is very vulnerable, easily chafes and heals none too readily, so that pressure, if used at all, must be evenly and widely distributed.

The NIGHT CLOTHING should also be woollen, although a flannel nightdress may be worn over one of cotton, linen or silk if preferred, and all bands should be easy. Some form of woollen or silk night cap is desirable, especially where the head is bald, and lambswool socks or stockings should be used when the circulation is feeble.

Boots and gloves should be loose, soft and light; overshoes of felt and rubber are useful in wet or cold weather, and house slippers may be of felt lined with flannel, down or fur. The head covering of old men should be a soft hat or cap, and of old women a hood-shaped bonnet.

Baths.—The daily bath should wherever possible be continued, but should not be either too hot or too long, but should be at a comfortable temperature and the process should be somewhat rapid. Soap should be used and the skin rubbed with a soft loofah or flesh brush and dried with a soft rough towel. In many cases it may be convenient that it should be taken before getting into bed, especially if a hot bath is preferred.

Hot air or Turkish baths may be allowed to those in good general condition; they to some extent replace exercise, promoting metabolism and favouring the elimination of waste products; but they should not be allowed to persons of spare nervous habit or to those suffering from organic disease with the exception of chronic Bright's disease, and in this case the hot air bath should be taken with the patient in the recumbent position, its duration should not exceed twenty minutes, and there should be always an attendant present throughout. After the bath the patient should be carefully dried and kept at rest for a couple of hours.

Massage where it can be obtained is most beneficial to old people, provided that the sittings are not too long; they should not exceed twenty minutes at first, but may be lengthened by five minutes every week up to a maximum of forty minutes. The best time for the sitting is after the daily walk,

and the patient should then rest (and sleep) for an hour.

Drugs.—There are no drugs that have any specific effect against physiological old age. It has been suggested that X-rays would prevent the whitening of the hair by destroying the chromophage cells, but there are probably still many who think that "the beauty of old men is the grey head" and that "the hoary head is a crown of glory."

There is a great demand for tonics, and phosphorus, strychnine, iron and quinine have all had their day separately or combined. At present Sanatogen is the popular restorative. Alcohol is still too much a panacea, but is not so much of a favourite as it once was. Cod-liver oil is perhaps the best "tonic," a teaspoonful being taken three times a day after food. But where the appetite is good, sufficient sleep is obtained, digestion is performed without discomfort and the bowels act regularly the patient is better without drugs.

A useful formula for the climacteric period in women is No. 8, Appendix I.

Some years ago the profession was more amused than surprised by the announcement of the eminent but eccentric neurologist Brown-Séquard that at the age of seventy-two he experienced a return of vital energy, which he had regarded as irremediably lost, after the injection of fresh extract from the testicles of young dogs; he said he felt himself younger by ten years, and that his bowels and bladder regained their former regularity. This remedy had a certain vogue for some years, but of late years has fallen into disuse. It is more than probable that such effects as were observed after its use were due to the psychical effects of a reputed remedy.

Prostatic extract has been tried in various diseases of the prostate and after extirpation of this gland without conclusive results.

On similar principles ovarian extract was recommended by Brown-Séquard for the treatment of the various troubles of the menopause, and good results have been obtained from its use by Landau, Mainzer and others, so that Paul Carnot speaks of it as affording greater success than any other form of opotherapy. The preparations chiefly used are derived from the ovaries of the sheep, and are generally employed in the form of powder compressed into five grain tablets of which one or more is a suitable dose and may be repeated two or three times daily. Messrs. Burroughs Welcome and Co., whose preparations for opotherapy have justly gained the confidence of the profession, sell ovarian tablets under the trade name of "Varium" tabloids weighing five grains. This treatment has been found useful in women whose ovaries have been removed by surgical operation, in climacteric and post climacteric nervous disturbance, in hypertrichosis, and even in acute mania. Thus Geach has reported the case of a woman of sixty who had an attack of acute mania with insomnia and delusions of persecution; she was treated with ovarian extract in doses of at first ten and then twenty grains three times a day for ten days; the improvement was very marked; all the symptoms disappeared; the patient could dress and feed herself and converse rationally.

Ovarian opotherapy has also been found useful in the obesity which often comes on after the menopause but is probably inferior to thyroid extract for this purpose. It has been tried in the chronic rheumatism of elderly women without marked result,

in osteomalacia with improvement (Senator, Castellevi), but adrenal extract has done better, and both seem inferior to the effect of castration the results of which are evident. It has also been tried in climacteric tetany and in Graves' disease occurring at the meno-pause.

The soft roes of fish, which consist of agglomerated spermatozoids, and are chemically composed of lecithine, cerebrine, oleine and margarine with albuminoids and water, have been proposed for therapeutic purposes. The soft roe of the coal-fish has been recommended for diabetes by Schionnidg of Stamsund, and Mouneyrat has used the nucleinic acid derived from the soft roes of the herring, while Miescher of Bale prepared nucleinic acid from the sperm of the salmon. Nucleinic acid and the nucleinates have been held to possess an antitoxic action in the presence of bacteria, uric acid is dissolved by nucleinic acid, while nucleins provoke leucocytosis, doses of one centigramme to one gramme causing an increased leucycotosis of from 8000 to 30,000.

Nucleinates have been used with benefit in all the infections, in surgical operations, perforation of the bowel or stomach pneumonia, erysipelas, pulmonary tuberculosis and typhoid fever. The drug may be given in doses of one centigramme dissolved in normal salt solution, but much larger doses have been used by some practitioners.

Thyminic acid is a derivative of nucleinic acid and has been used as a solvent of uric acid in gout and gouty conditions. Tablets of "Solurol" (five grams) are prepared by Allen and Hanbury, they were for a time taken largely by gouty persons and their good effects were attested by a considerable number of observers, including Minkowski and Walker Hall.

Lecithine is a phosphorated fat especially abundant in brain substance and in the yolk of eggs; from the latter it is prepared commercially and sold under the name of ovo-lecithine. It is said to stimulate the growth of animals and plants, the multiplication of erythrocytes and haemoglobin, the increase of weight and appetite in the adult (Beauchamp), the calcification of bones, the development of intelligence (Danilewsky) and the action of the heart, while it appears to antagonise the processes of tuberculosis. It has been used therapeutically in neurasthenia, diabetes, pulmonary tuberculosis, chlorosis, anaemia in infancy and in the cachexia of old age. In the last condition it is claimed that it restores strength of body and mind and improves the general condition; diuresis is increased, force returns, and convalescence is shortened by its use. Lecithine or ovo-lecithine is given in doses of 3 to 5 grains daily by the mouth, or $\frac{3}{4}$ to 2 grains every second day by intra-muscular injection. For the latter purpose it may be obtained in sterules and for internal use in tablets, pills or granules.

Diet.—The aged undoubtedly require less food of both a nitrogenous and non-nitrogenous kind. Over-feeding does not supply them with extra power but over-taxes their digestive organs and surcharges the blood with waste products; as the power of assimilation is lessened and activity usually greatly reduced the food supply should be in due proportion. According to Munk and Ewald a man doing no work requires the following amount of food:—

	Protein.	Fat.	Carbohydrates.
Man	90 grms.	40 grms.	350 grms.
Woman ..	80 ,,	35 ,,	300 ,,

or, if we translate this into ordinary articles of diet it would mean—meat 240 grms., or 8 oz.; milk 250 grms., or ½ pint; bread 300 grms., or 10 oz.; biscuit 60 grms., or 2 oz.; butter 32 grms., or 1 oz.; potatoes 250 grms., or ½ lb.; sugar 21 grms., or ⅔ oz.; wine 200 grms., or 6⅔ oz.; coffee 420 c.c. or 14 oz.

Von Noorden has suggested the following scale for the reduction of the fuel value of the dietary of the aged:—

Age in years.	Percentage of reduction.
60–70	10
70–80	20
80–	30

Their diet should be reduced in amount in proportion to their inactivity; so long as they can work or take active exercise they may enjoy the diet of adult life, 35 calories per kilogramme of body weight, but they should be careful to avoid large meals and indigestible food. On account of their defective teeth all food should be easily masticated, such as, for example, minced or pounded meat and vegetables in purée. It should contain few toxins, especially purins, a little meat once a day may be allowed, preferably at the midday meal, while eggs may replace meat at the evening meal; they require little alcohol but plenty of water; little salted food should be given as we are ignorant of the conditions in which chlorides are eliminated.

If they are leading more or less vegetative lives they require a smaller amount of food than active adults. We may take it that 30 calories per kilo is a sufficient basis for their dietaries, and if they are obese they should do with less, as fat ought not to

be reckoned in estimating the fuel requirements. These 30 calories might be made up by—

1 grm. per kilo of protein
1 grm. ,, fat
4 grms. ,, carbohydrates

so that an old person weighing 70 kilos (10 stone) might be allowed 70 grams of protein; 70 grams of fat and 280 grams of carbohydrates, which would give a little over 2000 calories, as against 2450 calories for an adult of the same weight, leading a moderately active life.

These figures perhaps convey little to the mind of many persons, but by reference to the tables (Appendix V.), it should be possible for any one to construct a dietary containing these quantities. However, it may be useful to give a few examples to show how this may be done. Thus the daily dietary might be composed of the following articles:—

	Protein.	Fat.	C.H.	Calories.
Bread 250 grms. (8 oz.) ..	22·08	3·12	127·4	640
Milk 568 grms. (1 pint) ..	17·9	19·6	26·88	375
Tapioca 45 grms. (1 oz.) ..	0·3	0·0	36·0	150
Sugar 30 grms. (1 oz.) ..	0·0	0·0	29·2	120
Potatoes 120 grms. (4 oz.) ..	1·8	0·12	24·0	105
Lean meat 100 grms. (3½ oz.)	27·0	7·0	0·0	185
Fat bacon 30 grms. (1 oz.)	2·6	20·75	0	187·5
Butter 30 grms. (1 oz.) ..	0·21	24·3	0·15	270
	71·89	74·89	243·63	2032·5

Such articles as tea and coffee, beef tea and bouillon, green vegetables and fruit in moderation contain so little heat-forming substances that they may be left out of account, but may be added to any of these diets.

In order to illustrate the distribution of this amount of food (heat units) still further the following

arrangement of meals is suggested. In No. 2 an equal amount of butter (1 oz.) replaces the bacon, and oatmeal is substituted for tapioca.

No. 1.

Breakfast.	Dinner.	Tea.	Supper.
½ pint of tea	3⅓ oz. meat	½ pint of tea	10 oz. milk
3 oz. of milk	4 oz. potato	3 oz. milk	1 oz. bread
¼ oz. sugar	1 oz. tapioca }	¼ oz. sugar	
3 oz. bread	4 oz. milk }	3 oz. bread	
½ oz. butter	½ oz. sugar	½ oz. butter	
1 oz. bacon	1 oz. bread		

No. 2.

½ pint coffee	6 oz. fish	½ pint tea	10 oz. milk
1 oz. oatmeal	4 oz. potato }	3 oz. milk	1 oz. bread
6 oz. milk	1 oz. milk }	¼ oz. sugar	
¼ oz. sugar	1 oz. butter }	3 oz. bread	
½ oz. butter	stewed fruit	½ oz. butter	
3 oz. bread	½ oz. sugar		
	1 oz. bread		

Another dietary for an old person of seventy weighing from 120 to 140 lbs. affording 1950 calories would contain—

47	grammes of	albumen
314	,,	carbohydrates
54	,,	fat
20	,,	alcohol

Such a diet may be thus distributed.

Morning meal—
Milk 8 oz.
Sugar ⅔ oz.
Bread 2 oz.
Butter ⅙ oz.

Midday meal—
Bread 3 oz.
Meat or fish 2 oz.
Vegetables or fruit 2 oz.
Beer ½ pint

Evening Meal—
Bread 3 oz.
Eggs 2
Light pudding 4 oz.
Whisky ½ oz.

If it is desired to raise the calorific value of the diet this is most readily done by adding to the fat in the form of butter, cream, fat bacon, suet (pudding) or cheese; many old people can take cod-liver oil of which half an ounce daily would afford approximately 150 calories. After fats come the starches and sugars, especially such almost pure starches as rice, sago, arrowroot and tapioca; cane sugar is almost pure carbohydrate but as a rule can only be tolerated in relatively small quantities and is better assimilated if cooked, as in milk puddings or added to well stewed fruit; RAW sugar is apt to cause gastro-enteritis in old persons and should be allowed with caution, but the small quantities required to sweeten tea or coffee are not likely to do harm. Milk furnishes about 400 calories to the pint as it contains both fat (cream) and sugar (lactose), but the quantity (1 pint) included in this dietary is often as much as can be comfortably digested. It is by no means to be denied that persons who do not digest milk well are not uncommonly met with; on a milk diet even when it is well diluted or citrated the tongue becomes coated, appetite is lost, nausea supervenes and even vomiting may occur, so that we are obliged at times to give up what seems the simplest, blandest and most natural food.

Sour milk or yoghourt or bulgarian clotted milk is prepared with previously boiled milk and is therefore sterilised and pathogenic bacteria destroyed. It may be prepared from skimmed milk if there is any difficulty in digesting entire milk. The ferment now employed is a pure culture of the lactic acid bacillus compressed into tablets; those prepared under the direction of Prof. Metchnikoff are sold under the name of Lacto-Bacilline tablets. The

milk at a temperature of 100° F. should be put into a thermos flask to which are added half a dozen tablets crushed in an ounce or two of the milk; the flask should then be closed and left for twenty-four hours when it will be found coagulated and ready for use. If it is too sour for the taste of the patient the time should be diminished. This clotted milk may be eaten by itself or sweetened with sugar, honey, jam, or treacle, and is very suitable as an addition to oatmeal porridge, hominy, boiled rice or any breakfast food. It is slightly laxative and is extremely useful as a means of overcoming chronic constipation; it also exercises a favourable influence on mucous colitis and other chronic affections of the large intestines. Reference has elsewhere been made to the opinion of Metchnikoff respecting its special value in old age by its power of diminishing the toxicity of the bowel contents and thereby preventing those senile changes which he regards as the results of intestinal intoxication.

Butter-milk can be obtained from any dairy where butter is made in the old-fashioned manner by churning whole milk, but in modern butter factories the milk is centrifugalised and the cream only used. It is therefore not easily purchased and must be prepared expressly by letting milk stand for twenty-four hours after being treated by the addition of a small quantity of sour milk; this milk after standing is beaten in a churn for thirty or forty minutes and the butter removed by straining through muslin; the thin opalescent filtrate is butter-milk, which may be used in place of milk by dyspeptics and by old persons who cannot digest entire milk. Its nutritive value is considerable from the casein it contains, but its calorific value is on an average about half that of milk.

From time immemorial the Tartars of the Russian Steppes have drunk the fermented milk of their mares and this beverage is called koumiss. Taken in large quantities it is highly nutritious and slightly stimulating. Some years ago consumptive patients were sent to a station in South Russia to drink koumiss, but probably for want of other necessary adjuncts of the rational treatment which was not then understood, the method did not attain any great success, although the pure air of the Steppes would suggest that they are an excellent situation for properly managed Sanatoria for tuberculosis. As koumiss rapidly changes it cannot be transported, on which account fermented cow's milk has been used as a substitute, and can be obtained as a commercial article under the name of kefir in many large cities, but owing to the objection that it undergoes rapid changes it is not much used away from the centres in which it is made. Fresh kefir is a pleasant slightly acid frothing liquid smelling slightly of cheese, but after two or three days it becomes disagreeable from increased acidity and the development of a decidedly strong odour of rotten cheese. It contains lactic acid, a little alcohol and carbonic acid gas ; the casein is in part peptonised. When fresh, kefir acts as a mild laxative. It is readily digested and highly nutritious in large quantities, by which is meant from a pint and a half to three pints daily.

Cheese is one of the most concentrated and economical foods that we possess, and it is much to be regretted that its employment has been relegated to a secondary position in the food of the people. It is readily digested, easily transported, and keeps better than any other proteid food ; with bread it affords all the elements of a perfect diet, but it may

be incorporated in many dishes, adding an agreeable flavour and greatly increasing their nutritive value. The common practice of eating cheese at the end of a full meal has earned for it a reputation for indigestibility which is undeserved and depends mainly upon its flavour being readily detected in the eructations that are apt to arise from an over-filled stomach. If those who think they cannot digest cheese would give it a fair trial, making a moderate meal of cooked fruit with bread and cheese in two courses, they may convince themselves that it is not the cheese that has been to blame when they have suffered from indigestion.

Alimentary pastes in the form of vermicelli, macaroni, spaghetti, etc., are of high nutritive value and readily digestible if cooked simply. They consist of the gluten of wheat with a considerable proportion of the starch and are of especial value in the dietetics of intestinal diseases (Combe).

	Cost per lb.	Proteid.	Carbohydrate.	Fat.	Calories per 100 grams.
Macaroni ...	4½*d.* to 6*d.*	12·15	74·58	0·78	340
Vermicelli ..	6*d.*	12·82	70·78	0·74	335
Italian Paste	7½*d.*	12·31	75·16	1·95	345
Rice boiled ..	2*d.* to 4½*d.*	2·77	27·33	0·07	119
Tapioca ...	4*d.* to 5*d.*	5·40	87·18	0·19	350

Their price is little more than that of rice, sago, and tapioca, but their nutritive value is at least double so that they are distinctly superior from an economic point of view; but unfortunately this is a consideration which enters very little into the choice of food with our countrymen and countrywomen, unless to the extent of creating a distinct prejudice against anything that is recognised as "cheap."

These foods deserve a high place in the dietary of old people as when properly cooked they are easily masticated.

Sugar is the most important alimentary principle of our diet, but raw cane sugar is liable to cause gastritis and enteritis so that there is a well-founded prejudice against its immoderate use. Cooked sugar is in part inverted into glucose and has lost this irritating property, while maltose, the sugar formed by the diastatic action of the salivary and pancreatic diastase, is also innocuous in this respect. Honey consists of a mixture of glucose, laevulose and saccharose and has long justly enjoyed a reputation for being free from the injurious properties of raw cane sugar, and this is also true of treacle, hence the preference of honey and treacle for use in the nursery.

Old people have often lost their taste for sugar and sweets, especially among the poor, their diet having consisted for so long of meat and perhaps a few vegetables, with bread and beer, but sugar in its more digestible forms should not be omitted from their diet. They should be encouraged and indeed enjoined to eat puddings, tarts, fruits and other sugar-producing foods, and sugar, treacle or jam should be cooked with these. The taste for such things is readily acquired and they soon find themselves happier and quite as strong with less meat.

In considering the question whether the use of tea, coffee or cocoa should be permitted to old people we may admit that they are dietetic luxuries of no food value, containing a poisonous principle (caffeine, theobromine) and in some instances a great deal of tannin, that they all delay digestion, stimulate the heart and nerve centres and that to stimulate often

means to irritate. Even of cocoa, generally considered to be the least harmful, Neumann, according to Prof. Chusing, says it retards the absorption of protein and fat, delays gastric secretion, causes dyspepsia, diminishes appetite, has caused convulsions in an infant when taken by a nursing mother, renders children nervous and excitable, prone to nightmare or to talk in their sleep, and causes bilious attacks and skin eruptions.

On the other hand, we must allow that the use of one or other is a life-long habit, and that while their value may rest wholly in the imagination, the sense of deprivation is real, so that their moderate use ought not to be forbidden unless there is reason to believe that they are doing harm.

Tea, especially that of India and Ceylon, may irritate the stomach; this action probably depends on the tannin present, so that on account of the lower percentage of this substance in China tea it is to be preferred for persons with feeble digestions. Tannin is also bad for constipated patients. A useful suggestion for depriving tea of a good part of its tannin we owe to the late Sir Andrew Clark, who directed that the tea should be infused with milk instead of water; the tea leaf should be put in an infuser and the boiling milk poured over it. The tannin of the tea probably in part unites with the casein of the milk to form an insoluble compound that remains in the infuser.

Tea or coffee taken late in the day may cause insomnia. Tea, coffee, and cocoa should all be suspected in pruritus, in cramp, cardiac irregularity, tachycardia or cardialgia with or without evidence of organic disease. Both tea and coffee may cause irritability of the bladder.

The wholesale denunciation of tea as the main cause of the dyspepsia of poor women which used to be very commonly heard when the practice of tea drinking was less common than it is at present, was in my opinion ill-founded, and arose from a misapprehension of the real nature of the malady, which is not so much a gastric as a nervous disease, dependent upon debility, over-work, worry with insufficient and improper food; for the working-class wife and mother too often is so much occupied with feeding husband and children that she neglects her own meals and not seldom is too tired to eat when at the end of a long day she has the leisure to consider her own wants. I have been interested to read in German books dealing with the subject similar accusations made against coffee with the suggestion of tea as a preferable alternative, obviously for no better reason than the fact that coffee in Germany takes the place that tea holds in England in popular use and favour.

All these articles of diet manifestly produce some pleasure-giving physiological effect; they are to most people slight stimulants and used in moderation are to them innocent indulgences. Many elderly men refuse coffee after dinner with the remark that they used to take it and like it but have found of late years that it interferes with sleep, while in other cases elderly men become susceptible to heart disturbance from tea although their hearts are quite sound.

All that has been said about tea, coffee, and cocoa applies with equal truth to tobacco; it contains a poison which acts much in the same way, diminishing appetite, irritating the bladder and disturbing the heart's action. Its use may cause irregular heart,

tachycardia, weak pulse or cardialgia. The liability to suffer from mild tobacco poisoning increases with age, and any immunity that has been acquired by long habit is diminished; for this reason old people should be advised to limit their use of tobacco and its influence should be suspected when heart symptoms independent of obvious organic mischief are complained of. When there is organic heart disease it is much better for old people to give up its use altogether.

Its effect in destroying appetite may at times be very marked. An elderly man consulted me on one occasion for entire loss of appetite; he was accompanied by his wife, and I have always noticed that wives are especially distressed when their husbands do not eat well, often by their ill-founded but well-meant anxiety counteracting necessary restrictions on diet. But in this case the loss of appetite was so complete and there was such an entire absence of any disease to account for it that I felt sure it must be toxic; as I had heard that he had spent a great part of his life in China I thought of opium, but his perfectly frank amusement at the suggestion dispelled that notion; I then asked about tobacco and found I was on a better scent; his wife said he was a great smoker, smoking eight or ten long Trichinopoly cheroots daily. He had no idea that his loss of appetite could be due to this habit which was of long standing, and the case illustrates the remark already made that as life advances the poisonous action of tobacco increases.

Karell's milk cure is a regimen used for chronic heart disease. During the first week the patient gets every four hours a glass of skimmed milk from 2 oz. to 7 oz.; in winter it may be given warm.

If the patient is thirsty ordinary water or mineral water may be given in addition.

In the second or third week Karell added to the milk a little white bread toasted with salt and a small portion of salt herring; then he replaced the milk once during the day by milk soup (soupe au lait, *i.e.* milk thickened with a little flour). The treatment should be maintained for five or six weeks and then a gradual resumption of ordinary diet allowed.

Constipation is combated by enemata, the addition of coffee to the first glass of milk, the use of stewed prunes and baked apples.

Jacob's modification of Karell's treatment is to keep the patient in bed for the first five to eight days, allowing only 800 grammes (nearly 1½ pints) of milk daily given in divided doses of 200 grammes (7½ oz.), every four hours; during the next two to six days in addition to the milk the patient takes an egg in the morning and a biscuit at night. Later the supplement consists of two eggs and a piece of bread. Then, the quantity of milk remaining the same, a little minced meat, vegetables and rice milk pudding are added. Twelve days after commencing treatment the patient returns to his ordinary diet, but the amount of liquid should not exceed 800 grammes daily during the next two to four weeks.

Constipation should be treated by laxatives or aperient water. If there is thirst the mouth may be washed out with water.

It is claimed for this treatment that the heart is strengthened and that on the third or fourth day there is copious diuresis exceeding the liquid ingested and eliminating salts and toxic products, while œdema diminishes and weight is reduced. It is

recommended by Jacob in chronic myocarditis with heart failure and oedema; provided that the heart has sufficient resisting power and the kidneys act well. It succeeds where digitalis is powerless. Lenhartz regarded it as particularly useful in chronic bronchitis with emphysema.

The reduction of liquids is supported by the authority of Stokes, Peter, Hirschfeld, Huchard and Widal in certain forms of heart and renal disease.

Oertel's method is based on the principle that it is desirable to diminish the total mass of the blood and to reduce the quantity of water in the tissues by lessening the amount of liquids ingested and increasing the losses of liquid by excretion. Under these conditions the heart recovers its power and the circulation is carried on with greater ease.

When the case was complicated by obesity he reduced the amount of fat and carbohydrate in the diet while increasing the proteid allowance. With this regimen he combined regulated walking exercise at first on level ground then on rising ground, gymnastic exercises, vapour baths or dry heat to provoke perspiration and also massage.

In the later stages he recommended a diet rich in albumen to strengthen the myocardium. The following is an example of a dietary containing 2105 calories sufficient for a man of 60 to 70 kilogrammes (9 to 10 stone):—

1st Meal.—Coffee 5 oz., sugar $\frac{1}{6}$ oz., 2 eggs, a roll $\frac{2}{3}$ oz.
2nd Meal.—Apples $\frac{1}{2}$ lb.
3rd Meal.—Meat 5 oz., vegetables 10 oz., brown bread $2\frac{1}{2}$ oz., wine $7\frac{1}{2}$ oz.
4th Meal.—Coffee 5 oz., sugar $\frac{1}{6}$ oz.
5th Meal.—Meat $3\frac{1}{2}$ oz., potatoes 6 oz., bread $2\frac{1}{2}$ oz., wine $7\frac{1}{2}$ oz.
6th Meal.—Apples 1 lb.

This diet contains 135 grammes of albumen, 28 grammes of fat, 248 grammes of carbohydrate and 40 grammes of alcohol.

His method attained a considerable reputation for the treatment of chronic myocardial mischief in obese patients, but should be carried out with caution and under medical supervision. Schott of Nauheim only employs Oertel's dietary under these conditions, and even then in a modified form.

Dr. Schott has treated senile hearts with much success by the methods devised by him, consisting of saline baths and resistance exercises followed by an after cure of climbing gradients at one of the higher health resorts in the Taunus, Black Forest, or Switzerland.

The treatment is now carried out elsewhere and can be followed satisfactorily in England especially at Buxton and Llangammarch.

Early writers on the results of the Schott treatment were puzzled to explain the rapid reduction in the area of cardiac dulness which could be observed to follow the bath or exercises, but this has been explained by Abrams as the cardiac reflex which may be excited in various ways. Abrams induced the effect by simply rubbing the precordia with a piece of indiarubber and precordial massage is used for the same purpose. These proceedings undoubtedly give relief and exert an influence over the arterial pressure and the cardiac rhythm.

Dr. A. Galisch has recently recommended the following regimen. In the morning the patient takes a cup of tea with bread and butter, and if he is so hungry that he cannot wait for lunch he may take an egg with a small slice of bread and butter at ten o'clock. At one o'clock the meal is composed

of meat, vegetables, salad and stewed fruit. At tea-time coffee with a biscuit or bread and butter. In the evening nothing but a small piece of bread and butter. It is important that the quantity of food at breakfast and luncheon should be enough to satisfy the patient. During the first few days of this diet the patient feels hungry at night, but this soon ceases, and the patient forms the habit of eating more at the earlier meals, but this excess of nourishment is compensated by the work and exercises which follow. Under this regimen Dr. Galisch has found his patients lose regularly one or two pounds a week. When the patient has been reduced to his normal weight he may resume his evening meals provided he keeps a close watch over the result and resumes the regimen if necessary.

The regimen recommended by Dr. Harvey to his patient Mr. Banting, and published by the latter in "A Letter on Corpulence addressed to the Public," consists in principle of a dietary from which carbohydrates and fats has been as far as possible excluded while nitrogenous food is given in large amounts. No restriction is placed upon the quantity of liquids.

The regimen of Ebstein restricts carbohydrates but replaces them by a large proportion of fat (85 grammes), the nitrogenous food is moderate and the amount of liquid is restricted.

The regimen of Schweninger, which gained its reputation from the success with which it was followed by Prince Bismarck, consists in a number of small meals; in limitation of liquids and in the separation of these from the solid food.

The diet of Schroth is combined with the use of the wet pack during each night; the meals in the first stage are in the morning, dry rolls with a cup of

cocoa; at midday a sort of porridge, a little meat, some vegetables and compote of fruits without anything to drink; in the evening, barley water flavoured with lemon and sugar, and later from eight to fifteen ounces of wine. In the second stage the packs are continued and the patient abstains from all liquids for from one to six days, the diet consisting only in dry rolls. After the dry days follow the drinking days during which soup and porridge are allowed at midday and a pint to a pint and a half of wine in the evening, the effect being, it is said, often to cause the patient to show signs of intoxication. This stage lasts from three to seven weeks; he then repeats the whole process or returns gradually to normal diet. Good results are said to follow in obstinate syphilis, obesity, enteritis, gout, rheumatism and diabetes.

APPENDIX I

LIST OF FORMULAE

No. 1.

Stomachic Mixture.

℞.—
Sodii Bicarb. ʒij.
Tr. Rhei ʒiij.
Tr. Zinziberis Fort. ʒj.
Inf. Gent. Co. ad ʒxij.

Sig. Two tablespoonsful three times a day before food.

No. 2.

Bromide Mixture.

℞.—
Pot Bromidi.
Sodii Bromidi āā ʒij.
Aq. Camphorae ʒxij.

Sig. Two tablespoonsful at bedtime.

No. 3.

Compound Bismuth Mixture.

℞.—
Sodii Bicarb.
Bismuthi Carb. āā ʒij.
Pulv. Rhei ʒss.
Muc. Tragacanthi ʒiij.
Aq. Menthae Pip. Destill ad. ʒxij.

Sig. Two tablespoonsful before each meal.

No. 4.

Compound Bismuth Powder.

℞.—
Bismuthi Carb.
Sodii bicarb. āā gr. x.
Pulv. Rhei gr. ij.
Pulv. Cinnamomi Co. gr. v.
m. ft. pulvis mitte tales duodecim.

Sig. A powder in a little milk before each meal.

No. 5.

Antacid Mixture.

℞.—
Sodii Bicarb.
Bismuthi Carb. āā ʒij.
Magn. Carb. ʒiij.
Muc. Tragacanthi ʒiij.
Aq. Menthae Pip. Destill ad. ℥xij.
m.

Sig. Two tablespoonsful three times a day before meals.

No. 6.

Acid Mixture.

℞.—
Acid Nitrohydrochl. dil. ʒij.
Tr. Nucis Vom. ʒij.
Succi Taraxaci ʒiss.
Aq. ad. ℥xij.
m.

Sig. Two tablespoonsful three times a day after meals.

No. 7.

Aperient Iron Mixture.

℞.—
Ferri Sulph. gr. xxiv.
Magn. Sulph. ℥j.
Acid Sulph. dil. ʒss.
Aq. Menthae Pip. Dest. ad ℥xij.
m.

Sig. Two tablespoonsful three times a day.

No. 8.

Sedative Iron Mixture.

℞.—
Ferri et Ammon. cit. ʒij.
Potassii bromidi ʒij.
Sp. Ammon. Aromat ʒiij.
Aq. ad. ℥xij.
m.

Sig. Two tablespoonsful three times a day.

No. 9.

Olive Oil Mixture.

℞.—
Olei Olivae ʒiss.
Pulv. Tragacanthi Co. ʒss.
Aq. Aurantii Floris ad. ℥xij.
m.

Sig. Two tablespoonsful before each meal.

No. 10.

Mercuric Iodide Mixture.

℞.—
Hydrarg. biniod. gr. j.
Pot. Iodidi ʒj.
Inf. Gent. Co. ʒxij.
m.

Sig. Two tablespoonsful three times a day.

No. 11

Carminative Drops.

℞.—
Tr. Zinziberis Fort. 10.
Ol. Cinnamomi 1.
Ol. Carui 1.
Ol. Cajaputi 1.

Sig. Two to five minims on sugar.

No. 12

Jephson's Powder.

℞.—
Pulv. Guaiaci Resinae ʒss.
Sulphuris Praecip. ʒj.
Ft. pulv.

Sig. A teaspoonful in milk at bedtime.

No. 13

Compound Sulphur Confection.

℞.—
Sulphuris Sublim. ʒvj.
Pulv. Jalapae gr. xlviij.
Tr. Sennae Co. ʒiss.
Ol. Menthae Pip. ♏iij.
Theriacum ʒiss.
m. ft. confectio.

Sig. A teaspoonful in a little milk at bedtime.

No. 14.

Haemorrhoidal Ointment.

℞.—
Hydrarg. Subchlor. gr. xl.
Ol. Theobromatis ʒij.
Ung. Cetacei ad. ʒj.
Ft. Ungm.

Sig. The ointment to be used as directed.

No. 15.

Nitric Acid Mixture.

℞.—
Acidi Nitrici dil.
Tinct. Nucis vom. āā ʒij.
Inf. Quassiae ad ʒxij.
m.

Sig. Two tablespoonsful three times a day two hours after meals.

No. 16.

Bronchitic Mixture.

℞.—
Ammon. Carb. ʒss.
Tinct. Scillae ʒij.
Inf. Senegae ad. ʒxij.
m.

Sig. Two tablespoonsful every four hours.

No. 17.

Camphor Injection.

℞.—
Parolein 80.
Camphorae 20.
5 c.c. in sterilised ampulla.

Sig. One ampulla to be injected hypodermically every six or eight hours.

No. 18.

Quinine Mixture.

℞.—
Quininae Sulph. gr. xxiv.
Ac. Sulph. dil. ʒj.
Syr. Aurantii ʒiss.
Aq. ad ʒxij.
m.

Sig. Two tablespoonsful three times a day.

No. 19.

Morphine Linctus.

℞.—
Morphinae Hydrochlor. gr. j.
Syr. Tolutani.
Inf. Rosae acidi āā ʒij.
m. ft. linctus.

Sig. A teaspoonful when the cough is troublesome.
N.B. Each dose contains $\frac{1}{32}$ of a grain of morphia.

No. 20.

Asthma Mixture.

℞.—
Potassii iodidi ʒiss.
Liq. Arsenicalis ʒss.
Liq. Atropinae ♏xij.
Vini Ipecacuanhae ʒij.
Aq. Chloroformi ad ℥xij.
m.

Sig. Two tablespoonsful three times a day after food.

No. 21.

Asthma Mixture.

℞.—
Potassii iodidi ʒj.
Ammon. Carb. ʒss.
Tr. Scillae ʒij.
Tr. Belladonnae ʒij.
Inf. Senegae ad ℥xij.
m.

Sig. Two tablespoonsful every four hours.

No. 22.

Asthma Pill.

℞.—
Ac. Arseniosi gr. $\frac{1}{25}$.
Atropinae sulph. gr. $\frac{1}{100}$.
Ext. Gentianae q.s.
ut ft. pil. mitte 50.

Sig. A pill to be taken three times a day after food.

No. 23.

Asthma Mixture.

℞.—
Ammon. Carb. ʒss.
Pot. iodidi ʒiss.
Tr. Grindeliae robustae ʒiij.
Mist. Amygdalae ad ℥xij.
m.

Sig. Two tablespoonsful three times a day.

No. 24.

Heart Mixture.

℞.—
Tr. Digitalis
Tr. Scillae āā ʒij
Aq. ad. ℥xij,
m.

Sig. A tablespoonful three times a day.

No. 25.

Digitaline Granules.

℞.—
Digitaline granules (gr.) $\frac{1}{250}$.
(Nativelle).
mitte 50.

Sig. A granule three times a day after food.

APPENDIX II

DIETARY TABLES IN VARIOUS DISEASES

No. 1.—For Gastritis.

Breakfast. Toasted white bread; white fish boiled or broiled; cocoa, coffee, or China tea infused with milk; no butter.

Luncheon. A slice of mutton or a mutton chop without fat; mashed potato; milk pudding; water or soda water.

Tea. China tea infused with milk; sponge cake.

Dinner. No soup; white fish boiled or broiled; beef or mutton; fowl or game lightly cooked; mashed potato or any tender well-cooked green vegetable; baked custard or stewed fruit without cream; water or soda water.

Articles of diet to be avoided—

All fats, including butter, which should at most be taken sparingly; pork, ham, bacon, veal, salmon, mackerel, eels, lobster, crab, all fried and greasy dishes; porridge, brown bread, pastry; uncooked fruit, all fruit containing seeds and skins, or until these are removed; nuts of all kinds, raisins, currants; raw vegetables, salads, radishes, parsnips; pickles, sauces, pepper; cheese, cream cheese, malt liquors, spirits, port, madeira, sherry, Indian and Ceylon teas.

No. 2.—For Gout and Chronic Bright's Disease.

Breakfast. Force, shredded wheat or bread (no oatmeal) with milk or cream; toast or roll and butter; any fruit in season; milk and hot water; no tea, coffee, or cocoa.

Luncheon. Any vegetables (except asparagus, lentils, peas, haricot beans or broad beans) with butter or sauce; milk puddings (or an omelette occasionally); stewed fruit of any kind; cheese, butter, bread, toast or biscuit; water or mineral water.

Tea. Hot milk and water; with bread and butter or toast and cake.

Dinner. Vegetable soup (made without meat stock); food in other respects as at luncheon; dessert, any fruit in season.

No. 3.—Von Noorden's Dietary for Gout.

Breakfast. Milk or coffee with milk, milk, cocoa, or chocolate; porridge of oatmeal; grape nuts, hominy or green corn; bread and butter, honey or jam; eggs in different forms; fresh fruit; baked apple with cream.

Luncheon. Dishes made from eggs; green vegetables or salad; potatoes or sweet potatoes with butter; rice macaroni, green corn; bread with butter and cheese; fruits, nuts, almonds, figs, dates; milk sweet or sour; cream; grape fruit; ice cream; water ice, lemon squash; coffee and cream.

Tea. Tea with cream, cakes with butter, jam.

Dinner. Vegetable soups with cream and parmesan cheese; eggs prepared with milk, cream, butter or cheese; vegetables of various kinds; dishes made from flour, potatoes, rice, macaroni, vermicelli, spaghetti, milk, cream, eggs, butter or oil may be used in their preparation; vegetables, salads; bread, cakes; fruit, raw or cooked; sweet dishes, fruit juice.

No. 4.—For Oxaluria.

Breakfast. Weak coffee and cream, sugar if desired; any fish or bacon; butter; no milk or eggs.

Lunch. Meat or fish of any kind except liver, sweetbreads and kidneys; toast or rusk; potatoes, lentils, peas, asparagus, turnips, lettuce,

cucumbers, mushrooms, onions, salads; stewed apples; boiled rice or hominy; Vichy water, Contrèxeville, Salutaris, or distilled water; a little whisky if desired.

Tea. Weak coffee with cream as at breakfast; toast, teacake or cake, butter.

Dinner. Soup; any fish; any meat as at lunch; potatoes; rice, lentils, peas, turnips, onions, leeks, salads, mushrooms; stewed apples, pears, peaches or apricots; no jellies or rich pastry; beverages as at lunch; apples, nuts; coffee.

No. 5.—For Elderly Diabetics.

Breakfast. ½ pint of tea or coffee with ½ oz. of cream and 2 oz. milk; ½ a Brusson Jeune roll; ½ oz. butter; 2 oz. fat bacon; 1 egg.

Luncheon. 4 oz. fish, poultry, game or butcher's meat; 1 baked potato eaten with ½ oz. butter; any green vegetable or salad; 1 oz. cheese, butter; 2 Huntley and Palmer's breakfast biscuits; ½ oz. whisky with soda water.

Tea. ½ pint of tea with ½ oz. cream and 1 oz. milk; ½ Brusson Jeune roll with ½ oz. butter.

Dinner. Any clear soup; 4 oz. fish, poultry, game or butcher's meat; 4 oz. cabbage, cauliflower, French beans, brussells sprouts, vegetable marrow with ½ oz. butter; an apple, pear or apricots, bilberries or cranberries (not exceeding 4 oz. in weight) baked or stewed with 1 oz. cream; 2 Huntley and Palmer's breakfast biscuits; ½ oz. whisky with soda water.

Approximate calorific value 2450 heat units.

No. 6.—Von Noorden's Oatmeal Cure for Diabetes.

"200 to 250 grams (6½ to 8 oz.) of oatmeal given in the form of gruel in divided portions every two hours, 200 to 300 grams (6½ to 10 oz.) of butter and often about 100 grams (3½ oz.) of vegetable proteid, or a few eggs may be taken in addition. Otherwise nothing else is allowed except black

coffee or tea, lemon juice, good old wine or a little brandy or whisky."

Von Noorden gives "glidine" for "vegetable proteid"; aleuronat and gluten flours contain 25 to 30 per cent. of carbohydrate; almond and cocoanut flour about 17 per cent.; perhaps it would be better to adhere to the alternative of "a few eggs."

The dietary of half a pound of oatmeal with as much butter is not pleasant; owing to the large amount of butter its fuel value is relatively high, 2840 calories.

No. 7.—For Obesity.

Breakfast. Tea or coffee without milk, cream or sugar; a slice of lemon or saccharine may be used if desired; half a Brusson Jeune roll or four Huntley and Palmer's breakfast biscuits, or one ounce of toast with butter; one or two eggs; any lean meat, game or fish; any salad or fruit in season.

Luncheon. No soup; one dish of lean meat, poultry, game or fish with salad or green vegetables or ¼ lb. of potatoes, artichokes, or peas; an omelette or any stewed fruit sweetened with saccharine; a little cheese or savoury with one Huntley and Palmer's breakfast biscuit; no butter; no alcoholic drink; black coffee sweetened with saccharine.

Tea. One or two cups of tea with a slice of lemon but without milk, sugar or cream; half a Brusson Jeune roll or one ounce of toast with butter.

Dinner. The same diet as at luncheon; any fruit at dessert; black coffee sweetened with saccharine.

No. 8.—Von Noorden's Obesity Diet.

Maintenance diet calculated at 2500 calories—

I.	Reduced	twenty per cent.	=2000 calories
II.	„	forty „	=1500 „
III.	„	sixty „	=1000 „

Diet III.

Coffee or tea without milk or sugar ; meat broth freed from fat with vegetables ; lean meat or fish 8 to 12 oz. ; cheese ; abundant green vegetables and salads prepared, with little butter or oil ; apples, peaches, strawberries, raspberries, currants, blackberries, cherries, grape fruit, sour oranges ; brown bread not exceeding 2 ounces ; potatoes from 3 to 6 ounces ; mineral water at discretion ; alcoholic drinks preferably omitted ; 1 to 2 eggs ; skimmed milk or butter milk.

No. 9.—Prof. Ewald's Test Breakfast (Modified).

2 oz. of bread or toast with $\frac{3}{4}$ pint of weak tea without milk or sugar.

This meal should be taken when the patient has been fasting for some hours and is therefore usually given in the morning. The stomach contents should be withdrawn exactly an hour after the meal was commenced and the withdrawn contents examined chemically and microscopically.

No. 10.—Test Meal for Stasis.

4 oz. of lean minced meat with 2 oz. of bread or toast and 20 or 30 currants ; there is no objection to the patient drinking water with this meal if he wishes it.

The stomach should be examined by passing a tube six hours after the meal was commenced, and the contents, if any, withdrawn ; a little water may be poured into the stomach in order to syphon off anything that may be there. Whatever is obtained should be put in a conical glass and the sediment examined microscopically for fragments of currant skin.

APPENDIX III

DIETARY RECIPES

1.—Toast Water.

A piece of bread crust — 1 pint of cold water

Toast the bread crust thoroughly without burning it; break the toast in pieces and drop it into the water in a jug; cover and let it stand until the water is the colour of sherry; strain and serve cold.

2.—Barley Water.

2 oz. pearl barley
1 pint of boiling water
The thin rind of ½ a lemon
Castor sugar to taste

Wash the barley and put it in a jug with the thin lemon peel and sugar; pour on the boiling water; cover the jug and let it stand until cold, then strain.

3.—Lemonade.

2 lemons
2 or 3 lumps of sugar
1 pint of boiling water

Peel the lemons very thinly, cut them in half and squeeze the juice into a cup; strain the juice into a jug, add the peel and sugar; pour on the boiling water; cover and allow to stand until cool, then strain.

4.—Egg Flip.

1 egg
½ tumbler of milk
1 teaspoonful of castor sugar
1 tablespoonful of sherry, brandy or rum

Beat up the egg with the sugar and remove the speck; add the milk, stirring all the time; pour in the wine or spirit; cover quickly with a piece of kitchen paper and a towel and shake violently for two or three minutes; or whisk the mixture in the tumbler rapidly with a whisk.

5.—Punch.

½ bottle of whisky
½ bottle of sherry
¼ bottle of rum
2 lemons
¼ lb. of lump sugar
1 pint of boiling water

Peel the lemons very thinly and put the rind in the bowl with the sugar; pour on sufficient boiling water to cover them. Squeeze the juice of the lemons into a cup, remove the seeds and add it to the mixture in the bowl stirring it up. Pour in the whisky, then the sherry, and lastly the rum, stirring all the time. Taste it and add the rest of the boiling water. It is always better if it can be allowed to stand for an hour before being drunk. Such punch may be allowed to go cold and be bottled, being poured through a wine strainer.

6.—Thickened Milk.

½ oz. flour
½ pint of milk

Put the flour in a basin and add a tablespoonful of milk; stir with a wooden spoon until smooth then add the rest of the milk, gradually stirring all the time; pour it into a small lined saucepan that has been rinsed out with cold water and stir over the fire until it boils; boil for ten minutes.

7.—Beef Tea.

1 lb. lean beef
1 pint of cold water
1 teaspoonful of salt

Wipe the meat with a damp cloth, remove all skin and fat, scrape it finely, put in a jar with the salt and water, stirring it well. Cover with greased paper and tie down; or use a jar with a tight-fitting lid, or use a beef-tea extractor; let it stand for half an hour. Thirty drops of dilute hydrochloric acid or a tablespoonful of lemon juice may be added to assist the extraction. Place the pan in a slow oven for four hours or stand it in a saucepan with cold water reaching half-way up its sides and boil slowly for three hours; if the water boils away too fast add more cold water. Larger quantities require more time, and in this case the lid should be raised and the mixture stirred once or twice to prevent the meat forming an impermeable mass; strain and remove all grease with blotting paper before serving.

8.—Whey.

1 pint of new milk
1 teaspoonful of rennet

Warm the milk in a basin to body heat and stir in the rennet; let it stand by the fire until the curd forms and the whey is clear; then let it cool; break up the curd and strain off the whey.

9.—Linseed Tea.

A tablespoonful of whole linseed
1 pint of boiling water
2 or 3 lumps of sugar
The rind and juice of half a lemon

Peel the lemon very thinly, put it into a jug with the linseed sugar and lemon juice from which the pips must be removed; pour over the boiling water and let it stand till cold. Strain before serving. Liquorice, sugar candy or honey may replace the sugar.

10.—Water Arrowroot.

½ oz. arrowroot
½ pint of cold water
1 teaspoonful of sugar

Put the arrowroot into a basin, add a tablespoonful of water and stir it with a wooden spoon until quite smooth, then add the rest of the water; mix well and pour into a small lined saucepan. Stir over the fire until it boils and thickens, let it boil for 7 to 10 minutes longer. Sweeten to taste, serve in cup or small basin; add wine or brandy if desired.

11.—Milk Arrowroot.

This is made in exactly the same way, but substituting ½ pint of milk for the ½ pint of water.

12.—Toast.

The secret of good toast is stale bread; if there is no stale bread the slices, which should be about a third of an inch thick, should be placed to dry in a slow oven for ten of fifteen minutes; then toast on a toasting-fork; first one side then the other before a clear fire; stand them in the toast rack to cool and serve as soon as possible.

13.—Anchovy Toast.

1 teaspoonful of anchovy paste
½ oz. butter
A round of toast

Melt the butter on a hot-water plate; stir the anchovy paste into the butter and mix well; keep it hot. Toast the bread, and when it is done dip it into the mixture, first one side then the other; cut the toast into convenient sized pieces and serve at once on a hot or preferably hot-water plate; to be eaten with a knife and fork. This is one of the most appetising dishes, and will be appreciated by many convalescent patients.

14.—Fish Quenelles.

¼ lb. white fish (Dover or Aberdeen sole, whiting or turbot)
1 oz. butter
2 oz. bread crumbs
½ egg
Salt and lemon juice

Shred the fish, pound it in a mortar with the bread crumbs, butter and flavourings. Beat up the egg and add half to the mixture pounding it again; rub the whole through a fine sieve; shape it into quenelles (egg shaped) with two spoons and a knife dipped in hot water to prevent them sticking; place the quenelles in a pan into which pour sufficient boiling water to cover them and poach slowly for ten minutes. Serve on a piece of toast on a hot plate.

Quenelles may be made of beef or mutton, chicken or game.

15.—Fish Cream.

The ingredients are the same as for the Quenelles except that only the white of one egg and ½ gill of milk and ½ gill of cream are wanted.

After pounding the fish rinse out a saucepan with cold water to prevent the mixture sticking to it; put the butter and milk into the pan and melt it over the fire; add the bread-crumbs and stir with a wooden spoon until the bread softens and the mixture thickens; add this to the fish in the mortar; pound well together and put it through a sieve. Beat up the white of egg to a stiff froth; whisk the cream until thick; add both to the fish mixture and mix them lightly but thoroughly; pour the mixture into a greased basin, and place the basin in a saucepan of hot water coming half-way up its sides; cover the pan and steam for fifteen minutes; lift out the basin, let it stand for a minute or two then loosen the edges and turn out on a hot plate.

Chicken cream may be made in the same way, using the breast of the bird only.

16.—Fish Soufflé.

¼ lb. cooked fish
½ oz. butter
½ oz. flour
½ gill milk
2 eggs
Salt and lemon juice

Scrape and pound the fish in a mortar; melt the butter in a small saucepan, add the flour and mix; pour on the milk and stir until it thickens and is smooth; put this mixture in the mortar with the fish seasoning and the yolks of the eggs; pound well and rub through a sieve. Beat up the whites of the eggs and stir them into the mixture; pour all into a greased basin which should be only half filled and cover with greased paper; steam slowly for fifteen or twenty minutes until it is well risen and firm to the touch; lift out, let it stand a few minutes and then turn out on a hot plate.

The breast of a chicken may be used instead of the fish.

17.—Chicken or Veal Panada.

¼ lb. of breast of chicken or filet of veal
1 teaspoonful of cold water
1 or 2 tablespoonsful of cream
A pinch of salt

Cut the meat into small pieces, removing fat and skin, put it into a basin with the water and salt, tie over the basin a piece of greased paper and steam slowly for 1 to 1½ hours. Put the meat into a mortar and pound thoroughly, then rub through a fine sieve; put the sieved mixture into a pan, add the cream and heat through; serve hot on toast or make into sandwiches to be eaten cold.

18.—Invalid Fruit Tart.

A penny sponge cake
1 egg
1 teaspoonful of castor sugar
½ gill milk
1 large apple peeled, cored, sliced thinly and stewed with the water and sugar until soft. Any other fruit can be used, but in many cases should be put through a sieve to remove skin and seeds
2 tablespoonsful of water
1 dessertspoonful of sugar

Stew the apple or other fruit with the water and sugar and spread it in the bottom of a small greased pie-dish;

cut the sponge in thin slices and lay it over the fruit ; beat up the yolk of the egg with the milk and pour it over the sponge cake ; bake in a moderate oven for about 10 minutes until the custard is set ; beat the white of the egg to a stiff froth, add the castor sugar to it, and pile it on the top of the tart ; bake again until the white is set, then take it out and sift a little sugar over it.

19.—Potato Purée.

3 or 4 large boiled potatoes
1 oz. butter
A pinch of salt
2 or 3 tablespoonsful of cream

Rub the potatoes through a wire sieve ; put them in a stew-pan with the butter, salt and cream ; stir the mixture over the fire until quite hot.

20.—Onion Purée.

4 good sized onions
½ pint cream
½ oz. butter
A teaspoonful of salt

Cut up the onions, put them into cold water with a pinch of salt and bring the water up to boiling point ; strain off the water and wash them in two or three cold waters ; stew them with the cream, butter and a pinch of salt with a greased paper on the top, by the side of the stove for half an hour ; pass the mixture through a sieve, warm it again in a *bain marie* until quite hot and serve.

21.—Spinach Purée.

2 lb. spinach
A pinch of salt and soda
A pint of cold water
2 oz. butter
1 tablespoonful of flour
2 tablespoonsful of good gravy

Pick the stalks off the spinach, wash it and put it in a saucepan ; pour the cold water on it to cover it and add the salt and soda ; bring the water up to boiling point ; strain it in a colander or sieve ; rinse with cold water ; rub through a wire sieve ; put it in a stewpan with the butter and flour, stir and add the gravy, stir it until it boils, then turn out, press it into a shape and serve.

22.—Apple Purée.

¾ lb. apples
A small piece of cinnamon
2 oz. loaf sugar
½ pint of cold water

Slice the apples ; put them in a stewpan with the cinnamon sugar and water ; boil to a pulp ; rub through a sieve ; serve hot or cold with cream or milk pudding or alone.

23.—Poached Egg.

1 egg
A pinch of salt
A few drops of vinegar or lemon juice
A round of toast
Boiling water

Break the egg carefully into a small basin, keeping the yolk whole. Half fill a saucepan with water and put it on the fire to boil ; when the water boils add the salt and vinegar or lemon juice ; slip the egg in carefully ; boil slowly for three minutes until the white is set ; remove with small fish slice ; trim off the ragged edges ; serve on a round of hot toast, which may usually be buttered.

APPENDIX IV

DIABETIC RECIPES

1.—Vegetable Cream.

Blanch the vegetables (celery, lettuce, cabbage, cauliflower, asparagus, tomatoes, onions) until they are cooked; pass them through a tamis; put the purée in a saucepan, add the stock a little at a time to clear it; let it boil; add a large piece of butter and serve.

2.—Thick Soup.

A pint of thick stock, an egg, two tablespoonsful of cream, a stick of celery, an ounce of butter. Chop up the celery very finely, put it in a small saucepan with the butter; stir it over the fire for five minutes; add half the stock and let it cook until the celery is completely softened; pass it through a tamis and return it to the saucepan with the remainder of the stock. Beat up the egg with the cream and stir it in, warming gradually; season to taste.

3.—Russian Cream.

½ oz. of gelatine, 8 oz. cold water, 8 oz. milk, three tablespoonsful of glycerine, an egg, a dessertspoonful of brandy.

Soak the gelatine in the water until it is completely softened and drain it. Warm the milk, add the gelatine, the glycerine, and the yolk of egg; let it boil, then let it cool a little. Add the white of egg beaten to a froth, then the brandy. Pour it into a mould and let it set. This should be made the day before it is required.

4.—Von Noorden's Vanilla Pudding.

This contains only 25 grams of carbohydrate.

Milk 8 oz.; butter $\frac{1}{3}$ oz.; cornflower $\frac{2}{3}$ oz.; 1 egg beaten up; saccharine and vanilla essence to sweeten and flavour.

5.—Custard.

Two eggs, six pellets of saccharine; 8 oz. milk.

Dissolve the saccharine in the milk and warm over a moderate fire. Beat up the eggs thoroughly; pour the milk upon them and put the whole in a saucepan. Boil gradually, stirring all the time. When ready to serve add a teaspoonful of brandy.

6.—Spanish Soup.

Into hot fat put parsley, a little onion, tomatoes (without skins or seeds) and other permitted vegetables not cut up too small, scraps of mutton and poultry, and steam the whole tender. Add the broth and meat from a boiled sheep's head and serve the whole in a tureen.

7.—Swiss Eggs.

Spread 2 oz. of butter over the bottom of a flat dish, and lay upon it six thin slices of Swiss cheese; break six eggs and put them upon the cheese with the yolks whole; sprinkle over them salt, pepper, finely-chopped parsley and grated Swiss cheese. Bake the whole in a hot oven for ten or twelve minutes.

8.—Cheese Trifle.

3 oz. of grated cheese, 3 yolks of eggs and the whites beaten to snow. Melt some butter, pepper, salt, and a cupful of cream, and mix with cheese and eggs. Pour the whole into a pan and bake for fifteen minutes. Serve hot.

9.—Cheese Omelette.

One egg, 2 oz. grated Parmesan cheese, a tablespoonful of milk. Beat the egg well and mix it with the milk. Stir in the cheese, and fry it for twenty minutes in a well-buttered pan.

10.—Oyster Omelette.

Take the oysters out of their shells, remove their beards and chop their bodies up very fine, adding three drops of anchovy sauce. Beat up the yolks and whites of three eggs separately; mix the yolks with the oysters, add pepper and salt and a little finely-chopped parsley. Melt 1½ oz. of butter in a pan. Mix the white of egg with the oysters, and fry the whole some minutes in the butter.

11.—Tomato Souffle.

Take the insides of six to eight tomatoes and rub them through a hair sieve; add salt, pepper and lemon juice and the yolks of two eggs, and mix well. Beat the whites of three eggs until stiff and stir in carefully. Put the whole in a buttered pan, and fry it quickly over a good fire. When ready sprinkle some Parmesan cheese over it.

12.—Fish Salad.

Cut fresh broiled fish, freed from bones and skin, into square pieces half an inch thick, mix them with cold mustard sauce with capers, and put them on a flat dish. Over them lay anchovies, capers, pickled mushrooms, gherkins, hard-boiled egg cut in slices, and lettuce.

13.—Meat Salad.

Cold boiled or broiled beef or veal cut into squares and mixed with the sauce described below, capers, chopped anchovies and gherkins. Put them on a dish, and garnish with anchovies, hard boiled eggs, and lettuce.

The Sauce.—Some hard boiled yolks of eggs to be rubbed up with vinegar, oil, mustard, parsley, and shredded onion.

APPENDIX V

TABLE 1.

Adapted from Symonds' Table of Height and Weight for Men

Ages . . .	50–54.	55–59.	60–64.	65–69.
5 ft. 0 in.	134	134	131	
,, 1 ,,	136	136	134	
,, 2 ,,	138	138	137	
,, 3 ,,	141	141	140	140
,, 4 ,,	145	145	144	143
,, 5 ,,	149	149	148	147
,, 6 ,,	153	153	153	151
,, 7 ,,	158	158	158	156
,, 8 ,,	163	163	163	162
,, 9 ,,	167	168	168	168
,, 10 ,,	172	173	174	174
,, 11 ,,	177	178	180	180
6 ft. 0 ,,	182	183	185	185
,, 1 ,,	188	189	189	189
,, 2 ,,	194	194	192	192
,, 3 ,,	201	198		

TABLE 2.

Adapted from Symonds' Table of Height and Weight for Women.

Ages	50–54.	55–59.	60–64.
4 ft. 11 in.	128	128	126
5 ,, 0 ,,	130	131	129
,, 1 ,,	133	134	132
,, 2 ,,	137	137	136
,, 3 ,,	141	141	140
,, 4 ,,	145	145	144
,, 5 ,,	149	149	148
,, 6 ,,	153	153	152
,, 7 ,,	157	156	155
,, 8 ,,	161	161	160
,, 9 ,,	166	166	165
,, 10 ,,	170	170	169

TABLE 3.

In this Table the figures refer to 100 *grammes of each of the undermentioned articles.*

	Protein.	Fat.	Carbohydrate.	Common salt.	Purins.	Water.	Calories.
Butchers' meat—							
Lean beef ..	20·0	2·7		0·10	1–2·00	75·5	121
Beef fat ..	1·2	88·9	—	—	—	10·0	831
Veal	19·5	0·9	—	0·07	1·10	77·8	103
Calves brains	8·8	8·2	—	0·04	—	81·0	119
Sweetbread ..	27·3	0·4	—	—	0·402	70·0	135
Pork	14·1	35·4	—	0·05	1·20	47·5	398
Pork fat ..	1·3	92·2	—	—	—	6·4	863
Mutton ..	16·6	28·3	—	—	0·96	52·3	343
Mutton suet	1·6	87·9	—	—	—	10·5	824
Unsalted							
Tongue ..	15·3	16·8	0·05	—	—	65·6	230
Heart ..	15·6	9·4	0·3	—	—	71·1	164
Kidney ..	16·4	4·1	0·4	—	—	75·5	119
Liver ..	17·7	3·4	3·3	—	0·11	71·5	130
Bone Marrow	2·8	83·6	—	—	—	4·7	791
Poultry—							
Goose ..	15·5	43·3	—	—	—	38·0	478
Duck ..	18·3	19·0	—	—	—	61·0	284
Fowl	19·2	1·3	1·3	—	0·052	76·2	111
Chicken ..	22·7	3·0	2·5	—	1·20	70·0	148
Pigeon ..	21·6	0·9	0·7	—	—	75·1	116
Turkey ..	24·1	8·1	—	—	0·050	65·6	191
Game—							
Hare	22·8	1·1	0·2	—	0·038	74·2	121
Partridge ..	24·6	1·4	—	—	—	72·0	132
Pheasant ..	24·4	4·8	—	—	—	69·9	183
Wild Duck ..	22·1	2·9	2·31	—	—	70·8	143
Fish—							
Eel	11·9	25·0	—	—	—	58·2	290
Trout ..	18·6	1·9	—	—	—	77·5	108
Hake ..	17·9	0·5	—	0·1	—	79·6	91
Halibut ..	18·0	4·7	—	—	0·1	75·2	131
Herring ..	15·0	6·9	—	—	—	75·1	137
Cod	15·5	0·3	—	0·59	0·50	82·4	77
Salmon ..	20·5	12·3	—	—	1·10	64·0	214

	Protein.	Fat.	Carbohydrate.	Common salt.	Purins.	Water.	Calories.
Fish (contd.)—							
Mackerel ..	18·4	8·0	—	—	—	70·8	164
Sole	14·2	0·5	—	—	—	82·7	73
Turbot ..	17·6	2·1	—	—	—	77·8	104
Whiting ..	16·3	7·4	—	—	—	72·8	148
Oysters ..	5·8	1·0	3·5	—	—	87·4	52
Lobster ..	13·8	1·7	0·1	—	—	81·8	83
Crab	15·0	1·2	2·4	—	—	78·8	93
Turtle ..	17·6	0·5	—	—	—	79·8	89
Smoked and salted meats—							
Frankfurt sausage ..	12·2	37·1	2·5	2·2	—	42·8	414
Ham	24·0	26·0	—	5·35	1·10	46·0	346
Bacon ..	8·7	69·2	—	—	—	10·2	686
Smoked tongue	23·7	30·0	—	—	—	35·7	394
Anchovy paste	12·0	1·5	5·1	40·1	—	36·8	93
Kippers ..	18·3	15·4	1·5	14·47	—	46·2	238
Bloaters ..	20·5	7·7	—	6·5	—	69·5	171

The figures for butchers' meat refer to raw meat. Boiling causes a reduction of 100 parts to—

57 of beef
72 of veal
70 of pork
62 of mutton

but the loss of nutritive value is trifling.

The broth contains on the average—

Protein.	Fat.	NaCl.	Purins.	Water.	Calories.
0·4–0·8	0·3–0.9	0·75	abundant	97·5	4–12

Roasting causes a reduction to 70–85; the loss of nutritive value is trifling.

Basting with fat greatly increases the nutritive value.

Gravy contains—

Protein.	Fat.	NaCl.	Purins.	Water.	Calories.
0·7–5·0	2·4–16·9	0·5	abundant	75–90	23–175

From poultry we must deduct 10 to 18 per cent. from the weight of the prepared bird for bones, etc.

Boiling reduces 100 parts of poultry to 63 without important loss of nutritive value.

Roasting affects it about the same as other meats.

Of fish poor in fat the edible portion is about half what is bought. In fat fish it is more—

Eels	..	..	80 per cent.
Salmon	..	..	65 ,,
Herring	..	..	54 ,,
Bloater and kipper		..	67 ,,

Boiling causes a reduction of 100 parts to about from 90 to 85.

New bread contains about 33 per cent. of water, which diminishes by keeping.

Vegetables lose on boiling 20 to 25 per cent. of their nutritive value. The quantity of common salt in home prepared broths, soups, and gravies is from 0·5 to 1 per cent.

In milk and dairy products the carbohydrate constituent is lactose.

In fruits, especially plums, apricots, and peaches, the carbohydrate is chiefly laevulose; in ground artichokes about one-sixth is inulin.

TABLE 4.

	Protein.	Fat.	Carbohydrate.	Common salt.	Purins.	Water.	Calories.
1 egg ..	6·1	5·6	0·3	0·069	—	36·1	75
1 yolk of egg	2·8	5·4	—	0·003	—	8·8	60
1 white of egg	3·6	0·1	0·2	0·05	—	24·2	11
Cow's milk	3·2	3·5	4·8	0·175	—	87·3	67
Cream ..	3·8	22·6	3·8	0·03	—	67·6	244
Sour milk	3·4	3·5	3·5	—	—	67·0	61
Fresh butter	0·7	81·2	0·5	0·02	—	13·4	761
Salt butter	0·7	81·2	0·5	1·0	—	13·4	761
Lard ..	0·2	95·1	—	—	—	0·7	885
Olive oil ..	—	100·0	—	—	—	—	930
Cod liver oil	—	99·0	—	—	—	—	920
Cheddar cheese ..	27·6	33·0	1·9	1·01	—	34·1	482

	Protein.	Fat.	Carbohydrate.	Common salt.	Purins.	Water.	Calories.
Cheshire ..	27·7	27·5	6·0	1·75	—	33·9	393
Gruyère ..	29·5	29·8	1·5	2·43	—	34·4	404
Gorgonzola	26·0	30·6	1·6–3·9	2·34	—	37·5	398
Dutch cheese	40·6	19·3	2·0	2·11	—	31·8	355
Wheat—							
Fine flour	8·6	0·8	73·6	0·02	—	12·6	344
Coarse flour	8·8	0·9	68·7	—	—	12·6	325
Oatmeal ..	10·5	4·1	63·1	0·16	0·53	9·7	341
Rice ..	5·9	0·3	74·7	0·010	—	12·5	330
Sago ..	1·5	—	79·1	—	—	15·8	323
Tapioca ..	0·5	0·1	81·8	—	—	14·5	330
Peas flour	21·7	0·7	54·3	0·026	0·39	11·3	329
Lentil flour	21·7	0·7	53·9	—	0·38	11·0	328
Soja flour ..	21·7	16·9	36·2	—	?	10·3	407
Nestle's Food	8·4	4·1	73·1	0·288	—	6·0	371
White bread	5·5	0·4	56·6	—	—	33·7	253
Brown bread	5·8	0·4	44·0	—	—	41·1	208
Oatcake ..	5·3	0·8	36·6	—	—	47·4	179
Vermicelli and Maccaroni ..	8·8	0·4	72·5	0·16	—	12·0	336
Potatoes ..	1·5	0·1	20·0	0·06	0·02	74·9	88
Ground artichokes ..	1·5	0·1	15·7	0·07	—	79·1	71
Peas ..	17·0	0·6	45·8	0·06	0·39	13·8	271
Lentils ..	18·2	0·6	44·6	0·23	0·38	12·3	272
Cauliflower	1·8	0·2	3·8	0·08	—	90·9	26
Winter cabbage ..	2·9	0·5	9·8	—	—	80·0	58
Savoy ..	2·4	0·4	5·1	—	—	87·1	36
Cabbage ..	1·3	0·1	4·2	—	—	90·1	24
Carrot ..	0·8	0·1	6·9	—	—	88·8	32
Green peas	4·7	0·3	10·4	—	?	77·7	68
French beans	2·0	0·1	5·5	—	?	88·7	32
Spinach ..	2·7	0·3	3·0	0·21	—	89·2	28
Turnip ..	2·5	0·1	9·5	—	—	81·9	51
Asparagus	1·4	0·1	2·0	—	0·009	93·7	16
Tomatoes ..	0·7	0·1	3·3	—	—	93·4	18
Marrow ..	0·8	0·1	5·5	0·05	—	90·3	26
Beetroot ..	1·1	0·1	7·0	—	—	88·0	34
Cucumber	0·8	0·1	1·9	0·07	—	95·4	12
Melon ..	0·6	0·1	5·3	—	—	91·5	25

	Protein.	Fat.	Carbohydrate.	Common salt.	Purins.	Water.	Calories.
Radish ..	0·9	0·1	3·2	0·02	—	93·3	18
Rhubarb ..	0·4	0·3	2·7	—	—	94·5	16
Celery ..	1·1	0·2	9·9	0·31	—	84·1	47
Horseradish	2·0	0·2	13·3	0·02	—	76·7	65
Endive ..	1·3	0·1	2·2	—	—	94·1	15
Lettuce ..	1·5	0·2	2·3	—	—	93·4	19
Onions ..	1·1	0·1	8·7	—	—	86·5	41
Spring onions	1·9	0·1	21·6	—	—	70·2	96
Apple ..	0·3	—	12·6	—	—	84·4	52
Pears ..	0·3	—	11·9	traces	—	83·8	49
Damson ..	0·6	—	11·6	—	—	81·2	49
Plum ..	0·8	—	13·4	0·003	—	78·6	57
Greengage	0·4	—	13·2	—	—	82·1	55
Peach ..	0·7	—	9·8	—	—	82·0	43
Apricot ..	0·6	—	8·9	0·004	—	84·1	39
Cherry ..	0·9	—	11·7	0·01	—	80·6	51
Grapes ..	0·5	—	17·4	0·01	—	79·1	72
Raisins ..	1·8	—	62·6	—	—	24·5	259
Strawberry	0·4	—	9·9	0·02	—	87·0	42
Raspberry	1·0	—	6·6	—	—	85·0	3
Bilberry ..	0·6	—	7·2	—	—	80·8	32
Blackberry	1·0	—	7·4	—	—	85·4	34
Gooseberry	0·3	—	9·8	0·05	—	85·6	41
Currants ..	0·4	—	9·7	—	—	84·3	41
Cranberries	0·1	—	6·0	—	—	89·6	24
Oranges ..	0·8	—	10·6	0·06	—	84·3	46
Pineapple	0·4	—	11·9	—	—	85·8	504
Banana ..	0·68	0·1	12·4	—	—	50·9	55
Dried Figs	2·7	—	56·3	—	—	28·7	238
Dried dates	1·4	—	71·9	—	—	18·5	295
Lemon ..	0·5	—	9·7	0·04	—	82·6	41
Dried currants ..	0·9	—	67·9	—	—	25·3	276
Almonds ..	15·0	47·8	11·2	—	—	6·3	562
Chestnuts ..	4·3	3·7	33·5	0·07	—	47·0	189
Walnuts ..	11·7	52·6	11·0	—	—	7·2	590
Filberts ..	12·2	56·3	6·1	—	—	7·1	607
Mushrooms	3·4	0·1	2·9	0·06	—	89·7	29
Truffles ..	5·3	0·3	5·3	—	—	77·1	49

	Protein.	Fat.	Carbohydrate.	Common salt.	Purins.	Water.	Calories.
Meat Extracts—							
Liebig's ..	60·2	0·2	—	—	—	17·7	246
Valentine's	14·1	5·8	5·0	—	—	62·1	130
Nutrose ..	80·3	0·2	3·0	—	—	10·1	402
Plasmon ..	67·4	0·6	9·6	—	—	11·9	370
Sanatogen	78·4	0·5	3·8	—	—	8·8	399
Somatose ..	79·4	2·1	—	—	—	10·9	332
Spices—							
Ginger ..	7·1	3·7	54·5	—	—	11·8	288
Capers ..	3·8	0·5	—	—	—	86·9	45
Parsley ..	3·7	0·7	0·7	—	—	85·0	23
Mustard ..	6·2	4·9	2·5	2·66	—	77·6	32
Liquorice ..	12·9	3·7	9·6	—	—	8·8	128
Cinnamon	3·7	1·7	19·6	—	—	9·8	100
Coffee ..	14·1	13·8	2·6	traces	1·16	2·4	—
Tea (leaves)	24·1	8·2	—	,,	2·79	8·5	—
Van Houten's Cocoa ..	18·7	32·3	11·9	,,	1·0	4·1	425
Sugar and Sweets—							
Cane sugar	0·3	—	94·6	—	—	2·2	380
Saccharine	—	—	—	—	—	—	—
Honey ..	0·8	—	78·1	—	—	19·0	316
Chocolate ..	6·3	22·2	58·4	—	0·62	1·6	458
Almond cakes	8·6	21·3	61·0	—	—	2·1	483
Sweet biscuits	7·0	3·0	72·4	—	—	11·7	352
Wines, etc.—	Extractives.	Alcohol.	Sugar.				
Moselle ..	2·2	7·7	0·3	—	—	90·1	63
Hock ..	2·8	8·2	0·5–0·8	—	—	89·0	68
Claret ..	2·6	7·8	0·3–1·7	—	—	89·6	65
Champagne	18·5	10·5	16·2	—	—	71·0	149
Port ..	8·0	16·6	5·8	—	—	75·4	149
Madeira ..	5·5	15·4	3·2	—	—	79·1	130
Marsala	5·3	15·8	3·5	—	—	78·9	132
Sherry ..	4·0	17·4	2·1	—	—	78·6	138
Brandy ..	1·0	42·0	0·7	—	—	—	298
Rum ..	0·5	59·6	0·2	—	—	—	419
Munich beer	6·6	3·3	5·2	—	—	90·3	(ca.) 51
Pilsener ..	5·4	4·6	3·9	—	—	90·0	50
Ale ..	6·4	5·0	2·6	—	0·006	89·8	(ca.) 40
Porter ..	9·6	4·9	5·2	—	0·006	89·5	74

TABLE 5.

Percentage of Cellulose in ordinary Articles of Diet.

Cellulose is of importance in diet for two reasons. It is indigestible and should therefore be excluded from the diet of persons suffering from catarrhal conditions of the digestive organs, but for the same reason it gives bulk to the faeces and stimulates peristalsis, so that it is valuable in the treatment of constipation. The following table gives the percentage of cellulose in some of the more generally used vegetable articles of food :—

Savoy cabbage	1·80	Oatmeal	2·39
Ordinary cabbage	1·81	Rice	0·60
Spinnach	0·93	Peas flour	5·7
Cauliflower	0·91	Green peas	1·57
Asparagus	1·00	Lentil flour	3·9
Cucumber	0·60	Haricot beans	8·1
Lettuce	0·6	French beans	1·18
Onion	0·7	Walnut	6·2
Mushroom	1·40	Apple	1·51
Radish	0·75	Pear	4·3
Celery	1·4	Cherry	6·0
Potatoes	0·75	Grapes	3·6
Artichoke	?	Plums	4·34
Turnip	1·3	Strawberries	2·52
Carrot	1·40	Gooseberries	3·5
Wheatflour	0·31		

APPENDIX VI

TABLE OF PHYSICAL EXERCISES FOR ELDERLY PEOPLE

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TABLE OF EXERCISES FOR ELDERLY PEOPLE

The best time for these exercises to be done is from one and a half hours to two hours after breakfast.

Each table should take from fifteen to twenty minutes.

The clothing should be as loose as possible. Warm slippers with no heels, or very low ones, should be worn.

I

General

(*a*) *Standing, arm rotation outwards with breathing.*

Position.—Stand with the arms hanging down, palms towards the body.

Movement.—Turn the arms out, in as small a circle as possible, without raising them, so that the palms face outwards. Take a deep breath while doing this and return to starting position during expiration.

(*b*) *Bend standing, arm stretching in all directions.*

Position.—Stand with arms bent at the elbows so that the fingers touch the *outer* side of the shoulders—with

shoulders drawn down and elbows as close to the sides as possible.

Movement.—Stretch the arms out vigorously—first, *forwards*, with palms facing; second, *upwards*, palms facing; third, *sideways*, palms downwards; fourth, *downwards*, palms inwards—returning to the starting position after each extension.

(*c*) *Reach grasp standing, alternate knee updrawing.*

Position.—Stand upright, heels together, grasping a bar at arm's length in front.

Movement.—Bending the knee, draw the left leg up as high as possible, then return to starting position and repeat with the right leg.

(*d*) *Wing stride standing, trunk rolling.*

Position.—Stand with hands on hips and feet two foot-lengths apart, on a straight line.

Movement.—Bend the body, 1st forward, 2nd to the right, 3rd upright and *very slightly* backwards, 4th to the left; repeat three times, so that the body is carried in a series of four circles. Return to starting position and, after a pause, repeat in opposite direction.

(*e*) *Wing standing, head flexion backwards.*

Position.—Stand with heels together, hands on hips.

Movement.—Keeping the chin in, press the head and neck backwards, stretching the back of the neck; take a deep breath while doing this and return to starting position during expiration.

(*f*) *Back support standing, trunk flexion sideways.*

Position.—Stand upright (as in Ex. I. (*a*)) with back against a wall.

Movement.—Keeping the back supported, letting it glide against the wall, bend the body to the left, allowing the left hand to glide down the left thigh. Take a deep breath while doing this, and return to starting position during expiration. Repeat, bending to the right. Flexion should take place as high up as possible, not at the waist.

(*g*) *Reach standing, double arm parting with breathing.*

Position.—Stand with both arms stretched out in front, at shoulder level, with palms facing, shoulder width between them, shoulders drawn down and back, and heels together.

Movement.—Slowly separate the arms as far as possible, keeping them at shoulder level throughout the movement, and trying to hold the shoulders back and down meantime. Take a deep breath while doing this, and return slowly to starting position during expiration.

II

For Obesity and Flabbiness

(*a*) *Standing, arm elevation sideways, with heel raising and deep breathing.*

Position.—(See Ex. I. (*a*)).

Movement.—Breathe in while rising on the toes and raising the arms slowly sideways to shoulder level, palms downwards ; breathe out while arms and heels are allowed to sink slowly to starting position.

(*b*) *Bend standing, arm stretching in all directions.*

Position.—(See Ex. I. (*b*)).

Movement.—(See Ex. I. (*b*)).

(*c*) *Yard grasp standing, one leg swinging.*

Position.—(See Ex. IV. (*e*)).

Movement.—Swing the leg on the side of the grasping hand backwards and forwards as far as possible. Change grasp to the other hand and repeat.

(*d*) *Bend sitting, trunk rotation.*

Position.—Sit with feet and knees together, the feet flat on the floor and arms in bend position. (See Ex. I. (*b*)).

Movement.—Turn the body from the hips as far round to the left as possible, keeping the head in the same relative position with the body the whole time. Turn back to starting position and repeat to the right.

(*e*) *Wing standing, foot closing and opening.*

Position.—(See Ex. I. (*e*)).

Movement.—Turn the feet inwards by putting the weight on to the heels, until their inner borders touch. Return to starting position by separating them in the same way, and repeat several times.

(*f*) *Grasp lying, alternate leg elevation.*

Position.—Lie flat on the back on a mattress (no pillow) grasping bed posts just above the head.

Movement.—Raise the left leg as high as possible, then allow it to sink slowly and steadily. Repeat with the right leg.

(*g*) *Bend standing, slow arm extension sideways with deep breathing.*

Position.—(See Ex. I. (*b*)).

Movement.—Taking a deep breath, stretch the arms out slowly sideways at shoulder level. Return to starting position during expiration.

III

For Mal-nutrition

(*a*) *Reach standing, arm parting with deep breathing.*

Position.—(See Ex. I. (*g*)).
Movement.—(See Ex. I. (*g*)).

(*b*) *Bend standing, arm stretching in all directions.*

Position.—(See Ex. I. (*b*)).
Movement.—(See Ex. I. (*b*)).

(*c*) *Back lean standing, alternate knee updrawing.*

Position.—(See Ex. I. (*f*)).

Movement.—Bending the knee, draw the left leg up as high as possible ; then allow it to return slowly to starting position and repeat with the right leg.

(*d*) *Bend kneel standing, trunk rotation.*

Position.—Take an upright kneeling position, knees and feet close together, arms in bend position. (See Ex. I. (*b*)).

Movement.—(See Ex. II. (*d*)).

(*e*) *Reach grasp standing, alternate toe and heel-raising.*

Position.—(See Ex. I. (*c*)).

Movement.—Raise the heels so as to throw the whole weight of the body on to the toes; then lower the heels and raise the toes, throwing the weight on the heels, and repeat several times. The body should be kept upright throughout the movement.

(*f*) *Wing foot grasp sitting trunk circling.*

Position.—(See Ex. IV. (*d*)).

Movement.—(See Ex. IV. (*d*)).

(*g*) *Reach grasp standing, head flexion backwards with deep breathing.*

Position.—(See Ex. I. (*c*)).

Movement.—Drawing the chin in, press the head and neck backwards during inspiration, returning to starting position during expiration.

IV

For Poor Circulation and Congestion

(*a*) *Wing sitting, chest expansion with breathing.*

Position.—Sit with hands on hips.

Movement.—Take a deep breath, drawing the neck and shoulders back and expanding the chest. Relax while breathing out.

(*b*) *Standing, double arm circling.*

Position.—(See Ex. I. (*a*)).

Movement.—During inspiration raise the arms forwards and upwards, above the head, keeping them parallel with palms facing. During expiration, separate them and allow arms to sink steadily outwards and downwards, returning to starting position, having turned the palms downwards at shoulder level.

(*c*) *Sitting, double foot circling.*

Position.—Sit with the feet crossed, either with legs outstretched and heels supported on the ground, or with legs on a stool, so that the feet are beyond it.

Movement.—Move the feet round in small circles both in the same direction about a dozen times. Change the position of the feet so that the top one becomes the bottom one, and repeat movements in the opposite direction.

(*d*) *Wing foot grasp sitting, trunk rolling.*

Position.—Sit with hands on hips, on a chair or stool, with feet fixed under a steady support (*e.g.* a low bed-rail), knees slightly bent.

Movement.—Trunk circling. (See Ex. I. (*d*)).

(*e*) *Yard grasp standing, one leg circling.*

Position.—Stand, heels together, with left arm outstretched to the side, grasping a firm support with the left hand.

Movement.—Raise the right leg forwards, then carry it in a circle outwards, then backwards, and down to starting position again.

The leg must be kept as high as possible throughout the movement, with the knee straight.

Repeat three times, pausing between each circle.

Take support with the right hand and repeat with the left leg.

(*f*) *Wing half-foot grasp standing, trunk flexion forwards.*

Position.—Stand upright with hands on hips, with left foot raised and pressed against a firm support (*e.g.* a low chair), with *both knees straight.*

Movement.—Lean forward from the ankle-joint, keeping the knees straight, stretching the back of the raised leg, and return to starting position. Raise the right foot and repeat.

(*g*) *Standing, arm rotation outward with breathing.*

Position.—(See Ex. I. (*a*)).

Movement.—(See Ex. I. (*a*)).

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